FOR OFFICIAL USE ONLY

Vol. 18. No. 8. pp. 323-358
Abstracts 1395-1549

August, 1948

THE VETERINARY BULLETIN

1948

COMMONWEALTH MYCOLOGICAL INSTITUTE
24 SEP. 1948

COMMONWEALTH BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Price 5/- net

Annual Subscription £2

Commonwealth Agricultural Bureaux.

EXECUTIVE COUNCIL

Lt.-Col. J. G. ROBERTSON, *Chairman*	Canada.
Sir PATRICK R. LAIRD, C.B., F.R.S.E., *Vice-Chairman*	United Kingdom.
J. E. CUMMINS	Australia.
G. A. HOLMES, B.Sc., B.Agric.	New Zealand.
A. P. van der POST	Union of South Africa.
J. W. DULANTY, C.B.E. (High Commissioner)	Eire.
Col. W. F. RENDELL, C.B.E.	Newfoundland.
R. S. MANI, I.C.S. (Officiating Deputy High Commissioner) ...	India.
THE HIGH COMMISSIONER FOR PAKISTAN	Pakistan.
B. O. BINNS, O.B.E., I.C.S.	Burma.
W. V. D. PIERIS	Ceylon.
A. V. HUBBARD	Southern Rhodesia.
J. G. HIBBERT, M.C.	Colonies, Protectorates and Mandated Territories.
Sir HERBERT HOWARD, 2, Queen Anne's Gate Buildings, London, S.W.1	*Secretary.*

COMMONWEALTH BUREAU OF ANIMAL HEALTH, WEYBRIDGE

Director, Veterinary Laboratory, Ministry of Agriculture and Fisheries, and Consultant Director of the Bureau:

Professor T. DALLING, M.A., M.R.C.V.S.

Director and Editor of The Veterinary Bulletin and of Index Veterinarius:

W. A. POOL, M.R.C.V.S.

Assistant Director:

M. CRAWFORD, M.R.C.V.S.

Scientific Assistants:

E. MARSH JONES, M.Sc., A.R.I.C.

E. V. LORD

F. A. ABBEY, B.A. (Cantab.), Dip. Forestry; Dip. Timber Tech.

Editorial Assistants:

PATRICIA F. STEVENS, B.A., B.Sc.

F. EILEEN WILLIAMS, B.A.

ABSTRACTORS CONTRIBUTING TO THIS ISSUE

United Kingdom

F. D. Asplin, M.R.C.V.S.
G. L. Bailey, B.Sc. (Agric.).
J. D. Blaxland, M.R.C.V.S.
E. Cotchin, M.R.C.V.S.
A. T. Cowie, B.Sc., M.R.C.V.S
Ethel M. Cruickshank, PH.D.
A. Eden, PH.D., M.A.
J. Edwards, M.R.C.V.S.
R. J. Fitzpatrick, M.R.C.V.S.
S. J. Gilbert, M.R.C.V.S.
Pamela S. Gordon, M.A.
J. R. Hudson, B.Sc., M.R.C.V.S.
Gertrude Huehns.
Isobel W. Jennings, M.R.C.V.S.
S. B. Kendall, B.Sc., M.R.C.V.S., A.R.C.S.
J. O. L. King, B.Sc., M.R.C.V.S.
E. Klieneberger-Nobel, PH.D., D.Sc.
E. Kodicek, M.D. (Prague), PH.D.
P. L. Le Roux, D.Sc., M.R.C.V.S.
A. Loosmore.
R. Macgregor, F.R.C.V.S.
Rachel Marshall, PH.D.
Anne Mayr-Harting, M.D. (Prague).
J. Deans Rankin, M.R.C.V.S.
U. F. Richardson, B.Sc., M.R.C.V.S.
J. M. Robson, D.Sc., M.D., F.R.S.E.
S. W. Salter, B.Sc.
Kathleen J. Sinclair.
K. G. Towers, B.V.Sc., M.R.C.V.S.
J. A. J. Venn, M.R.C.V.S., D.V.S.M.
A. G. Warren, M.R.C.V.S.
A. A. Wilson, B.V.Sc., M.R.C.V.S.

Australia

D. Forsyth Stewart, B.V.Sc.
D. C. Blood, B.V.Sc.
L. Hart, B.V.Sc., H.D.A.

Canada

Thos. Moore, V.S., B.V.Sc.
P. J. G. Plummer, V.S., B.V.Sc.
Christine E. Rice.
Dr. W. E. Swales.

India

S. Sen, M.Sc.

Pakistan

F. C. Minett, D.Sc., M.R.C.V.S.

Portugal

F. A. Esteves.

COMMONWEALTH BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 18.] August, 1948. [No. 8.

DISEASES CAUSED BY BACTERIA AND FUNGI

GIOVANNI, S. (1946.) Ricerche sul valore di alcune prove sperimentali di virulenza degli stafilococchi in rapporto alla loro virulenza clinica nelle infezioni chirurgiche. **[Tests for pathogenicity of staphylococci.]**—*G. Batt. Immun.* **35.** 217–236. [French and German summaries, abst. from author's summary.] **1395**

Tests include milk coagulation, gelatin liquefaction, Neter's test (coagulation, proteolytic action and fibrinolytic power), peroxidase, dehydrogenase, ammonium molybdate test and haemolytic power of the toxin. The results showed that none of the tests was entirely reliable. The Neter technique which is relatively reliable has the disadvantage that the results vary according to the blood serum used. The most suitable test is that for haemolytic power; there is a certain parallelism between the interval of the reaction and the severity of the disease.—K. J. SINCLAIR.

KÄMPE, Å. (1945.) Om matförgiftning och entero-toxiska stafylokocker. **[Food poisoning and staphylococcus enterotoxin.]**—*Skand. Vet-Tidskr.* **35.** 193–201. [English summary.] **1396**

The author reported two cases of food poisoning caused by staphylococcus enterotoxin and gave details of the characters of the strains. —F. E. W.

CECILIA, C. A. (1940.) El diagnóstico de la mamitis estreptocócica de la vaca. **[Diagnosis of bovine streptococcal mastitis.]**—*Trab. Inst. Biol. anim., Madrid.* **5.** 85–115. **1397**

A conventional discussion on the respective value of tests for mastitis in cows in Madrid. —R. MACGREGOR.

SHANAHAN, R. H., GRIFFIN, J. R., & VON AUERSPERG, A. P. (1947.) **Anthrax meningitis. Report of a case of internal anthrax with recovery.**—*Amer. J. clin. Path.* **17.** 719–722. **1398**

The authors describe anthrax in a wool picker where the initial lesion was on the upper lip. The organism was isolated in culture. Anti-anthrax serum was given, together with penicillin; 100 ml. of serum intramuscularly, then eight doses of 50 ml. at eight hourly intervals; 100,000 units of penicillin intramuscularly every three hours for five days and then 50,000 units every three hours for three days; a continuous 1 : 4,000 wet penicillin dressing was applied to the lesion. On the second day there was meningeal involvement and the organism was demonstrated in the cerebro-spinal fluid. Therefore 30,000 units of penicillin were then given intrathecally followed by 20,000 units every 12 hours for five doses and in addition 4 g. sulphadiazine followed by 1 g. every four hours for four days. The temperature began to fall on the third day and the meningeal irritation slowly disappeared by the eighth day. The patient was able to return to work 28 days later.

Anthrax meningitis has always been considered malignant and is thought to occur in about 5% of anthrax infections. Treatment by anti-anthrax serum alone is ineffective but there may have been a synergistic action between the serum and penicillin in this case.—K. S. TOWERS.

BONEZZI, G., CAVALLI, L., & MAGNI, G. (1942.) Mutabilita' sperimentale del bacillus anthracis. I. Azione dei raggi ultravioletti. **[Changes induced in *Bacillus anthracis*. I. Effect of ultra violet irradiation.]**—*G. Batt. Immun.* **29.** 686–697. [German and French summaries, abst. from English summary.] **1399**

By means of analysis with the Zeiss micromanipulator seven strains of varying virulence but of uniform biochemical properties were isolated from a *Bacillus anthracis* strain. Repeated irradiation of one of the pure strains resulted in a decrease in virulence and a lessening of fermentative activity. No morphological changes were observed.—K. J. SINCLAIR.

STEIN, C. D., & ROGERS, H. (1946.) **Recovery of viable anthrax spores from vapors of heated**

anthrax spore suspensions and from the distillate from anthrax spore suspensions.—*Amer. J. vet. Res.* **7.** 481–485. **1400**

Heating *B. anthracis* and *B. cereus* spore suspensions in tubes partially immersed in oil at 90–91°C. for 60 mins. was found to be an unreliable method of sterilization. Vapours containing viable spores condensed below the cotton wool plug and ran down to contaminate suspension previously sterilized by the heating. Viable spores were present in the condensation as suspensions were brought to the boil but after 3–5 minutes boiling the tubes were sterile.

The danger is stressed of boiling spore suspensions in open containers. Distillates may similarly contain viable spores carried over in the preliminary heating.—K. S. TOWERS.

HILLERMARK, K. (1945.) Ytterligare några bidrag till kännedom om spontan human tuberkulos hos nötkreatur. [**Spontaneous human type tuberculosis in cattle.**]—*Skand. VetTidskr.* **35.** 545–551. [Abst. from English summary.] **1401**

Human type *Mycobact. tuberculosis* was isolated from 12 cattle, all reactors to bovine tuberculin; seven of these showed no macroscopic lesions on P.M. examination. The human type bacillus was isolated from lung tissue and lymph nodes of five animals, the source of infection in each case having been traced to persons with open TB. in charge of the animals.

In five further cases the human type bacillus was isolated from local lesions the source of infection having again been traced to persons in charge of the animals.—E. V. L.

LALL, H. K., & SINGH, K. (1946.) **Comparative differential leucocytic counts in tuberculin positive animals and clinical cases of tuberculosis.**—*Indian vet. J.* **23.** 91–100. **1402**

A comparative study was made of the differential leucocytic counts in cows (4½–11 years), bullocks (5–8 years), bulls (2–5 years) and young stock (bull calves, below two years), classified as normal, tuberculin-negative and tuberculin-positive animals and clinical cases of TB., each group having 8–10 animals.

In normal animals, there was variation in the number of white cells in cows, bullocks and young stock, eosinophiles being significantly few in young stock. There was a difference in the morning and evening leucocytic counts in a batch of cows :– monocytes increased significantly in the evening but eosinophiles decreased, while the number of lymphocytes and polymorphs was greater in the morning.

In tuberculin-positive cows, there was significant increase in the number of polymorphonuclear cells, while in young stock, the increase was in the number of eosinophiles. In clinical cases there was increase to a significant degree in the number of polymorphonuclears in cows and bullocks, but there was a decrease in the monocytes and eosinophiles respectively in the same animals. In counts in clinical cases as well as in three cases of traumatic pericarditis, four cases of Johne's disease and three of general emaciation the number of eosinophiles was generally decreased.

Tables and appendices are given showing the average counts of leucocytes and the results of statistical analysis.

[There are many printing mistakes in the figures quoted. The values of t shown do not tally with those calculated from the figures given. It appears that the square root sign has been omitted in the denominator of the t values, except for the appendix II (b), where figures in the denominators are those obtained after taking the square roots. The above conclusions are drawn from the values of t calculated afresh from the figures given, except from table II, for which the conclusions have been drawn from the probabilities given, as the t values could not be calculated afresh.]—S. SEN.

MAGNUSSON, H. (1944.) Über manifeste Tuberkulose und Reaktionstuberkulose " No-visible-lesion reactors " beim Pferde. [**Manifest tuberculosis and " no visible lesion " reactions in horses.**]—*Acta path. microbiol. scand.* Suppl. No. 54. pp. 539–562. [In German.] **1403**

TB. was diagnosed in only 433 (0·09%) of 461,436 horses examined P.M. in Sweden between 1921 and 1942. As TB. in horses is usually not " open ", diagnosis during life is difficult. The tuberculin test is unreliable except when negative and it is also often difficult to isolate and determine the type of tubercle bacilli from diseased organs of horses.

M. investigated 26 cases of equine TB. in the course of 30 years. The three commonest sites of lesions were the spleen, lungs and mesenteric lymph nodes, the lesions commonly resembling fibrosarcoma. In 16 of the 26 cases microscopic diagnosis failed, but the diagnosis was assured either by the inoculation of g. pigs or histologically. In only five instances were numerous tubercle bacilli visible under the microscope. Type could be determined in only eight cases and in these the bovine type of bacillus was present; the remainder of the strains isolated were atypical. Tuberculin tests were only possible in a few of the 26 cases; they gave equivocal results.

Abattoir statistics of Sweden for 1942 show a TB. incidence of 19% in cattle, 0·9% in swine, 0·09% in horses and 0·01% in sheep and goats; 885 horses were tested with tuberculin of bovine

type and also with tuberculin of avian type; 101 (11·4%) reacted to bovine, and 277 (31·3%) to avian tuberculin and 84 of the reacting animals did so to both types. The percentage of reactions to avian tuberculin hardly indicates that fowls were the chief source of infection, as the extent of avian TB. in Sweden is considered to vary between 6–12%, much lower than that of bovine TB. The frequency of reactions to both types indicates that the results may not be specific, one suggestion being that "Mauke" or "Raspe" [? grease] is an infection by mycobacteria and gives rise to tuberculin allergy. In tuberculin tests carried out on horses with these conditions all reacted to tuberculin. Another piece of evidence regarding specificity was the observation in a large stud that horses lost their reactivity to tuberculin in the course of two years.

Three horses were artificially infected with tubercle bacilli, one with the bovine type, one with the avian type and one with both types. They reacted as expected to tuberculin and none of them developed recognizable infection.

From these observations M. considers that nearly all horses that react to tuberculin are free from infection with *Mycobact. tuberculosis*. The true aetiology is obscure and the problem resembles that of the "no visible lesion" and "skin lesion" reactions in cattle.—J. E.

NOORDIJK, E. (1940.) Enkele opmerkingen over de tuberculosebestrijding met rijkssteun onder het rundvee. **[The control of TB. in cattle.]** — *Tijdschr. Diergeneesk.* **67.** 811–821. **1404**

The campaign against bovine TB. was intensified during the year. In all the provinces, except Friesland, there was a central provincial antituberculosis organization with local sub-organizations. The sub-organization was controlled by a committee, appointed by the local stock-owners. Veterinarians, in charge of the examinations, were co-opted as advisory members. Participation in the campaign by stock-owners was voluntary. Owners could join and resign as they liked. N. noted that this was most unsatisfactory and maintained that stock-owners joining the campaign should be compelled to join for at least five years and accept all responsibilities connected with it.

The assistance rendered by the state consisted of the free issue of tuberculin, a subsidy for each animal examined and some compensation for the slaughter of "open" cases. N. suggested that additional state subsidies should be granted for the installation of improved water supplies, for the erection of partitions in stables for the isolation of reactors and for the destruction of the reactors if the owners were prepared to have them destroyed. The co-operative dairies should be assisted with installation of pasteurization plants; the intradermal test should be made compulsory because it is the more reliable and could be applied at pasture without having to stable the animals; reactors should be clinically examined every three months and kept separated from the non-reactors; the system of payment of an honorarium to veterinarians should be changed and a fixed fee paid for each "open case" found; the tuberculination and the clinical examination must be done by the veterinarian and not by lay staff; in areas where the incidence of tuberculosis had dropped below a percentage to be determined by the state, a commencement should be made with the control of other cattle diseases such as contagious abortion, Johne's disease and streptococcal mastitis.—P. LE ROUX.

VERLINDE, J. D., & BEKKER, J. H. (1947.) Een zuurvaste bacterie, gekweekt uit een op aviaire tuberculose gelijkende ziekte bij het varken. **[An acid fast bacillus isolated from pigs with lesion similar to those of avian type TB.]**—*Tijdschr. Diergeneesk.* **72.** 313–318. [English, French & German summaries.] **1405**

From the liver and lungs of a pig with lesions resembling those of avian type TB., the authors cultivated an acid fast bacillus which had the bacteriological characteristics of acid fast saprophytes. The culture was pathogenic for g. pigs, especially when suspended in liquid paraffin and injected intraperitoneally when it produced lesions similar to those in the pig.—F. E. W.

FELDMAN, W. H., & HINSHAW, H. C. (1947.) **Streptomycin in experimental tuberculosis.** *In vivo* **sensitivity to streptomycin of recently isolated strains of human tubercle bacilli and strains of bovine tubercle bacilli.**—*Amer. Rev. Tuberc.* **55.** 428–434. [Spanish summary, authors' summary copied *verbatim*.] **1406**

To determine the therapeutic antagonism of streptomycin to strains of mammalian tubercle bacilli other than the laboratory stock strain H37Rv, a series of 10 studies was done. Ten groups of 14 guinea pigs each were inoculated, ten different strains of tubercle bacilli being used. These consisted of seven original isolation cultures from 7 patients who had pulmonary tuberculosis, two bovine strains and, for comparison, strain H37Rv. The inoculum for each animal was 0·1 mg. of tubercle bacilli administered subcutaneously. Eight animals in each group were treated. The daily dose of streptomycin per animal was 6 mg. given in four equal doses six hours apart. Medication was started two weeks after inoculation and was continued for fifty-four days.

The results obtained from the 10 studies suggest the following conclusions: The susceptibility *in vivo* of mammalian tubercle bacilli to streptomycin is not strain-specific. Experimental infections produced in guinea pigs by bovine tubercle bacilli are amenable to the antagonistic action of streptomycin. In chemotherapeutic experiments conclusions based on the chemotherapeutic results of infections produced by the laboratory stock strain of tubercle bacilli H37Rv constitute dependable evidence of the degree of antagonism of a given substance for tubercle bacilli of the human type.

SOLOMIDÈS, J. (1946.) Sur le mécanisme de l'oléolyse tuberculeuse. [**Lysis of** *Mycobacterium tuberculosis* **by liquid paraffin.**]—*C. R. Soc. Biol. Paris.* **140.** 837–838. **1407**

The lytic action of oils on *Mycobact. tuberculosis* appears to be due to diastases or more correctly lipases. An oil such as cod liver oil which rapidly kills the bacilli prevents the action of lipases. Formalin and heat destroy this action whereas sulphuric ether which kills the bacilli does not inhibit oleolytic processes.—S. J. G.

KARLSSON, K-F. (1945.) Tvenne säregna fall av infektion med *Corynebacterium pyogenes.* [**Two unusual cases of** *Corynebact. pyogenes* **infection (horse and fowl).**—*Skand. VetTidskr.* **35.** 129–142. [English summary.] **1408**

K. investigated 11 strains of *Corynebact. pyogenes* by means of fermentation tests, in all of which acid was produced in xylose, glucose fructose, lactose, maltose, soluble starch, dextrin and glycogen. Certain strains also caused acid formation in galactose, mannose and sucrose. In 700 cases bacteriologically investigated at the Swedish State Veterinary Institute from 1938 to 1944 the frequency of *C. pyogenes* infection in various animals was :- adult cattle 374, pigs 187, calves 118, sheep 17, goats 2, horses 1, fowls 1.

The horse concerned had sinusitis; details are given. K. thought that it might have been infected by the use of insufficiently sterilized instruments.

In the fowl, changes were localized to a subcutaneous abscess in the head. In both the horse and the fowl trauma appeared to have been a predisposing factor.—F. E. W.

DOYLE, T. M. (1947.) **The susceptibility of swine fever-immune pigs to intracerebral inoculation with** *E. rhusiopathiae.*—*Vet. J.* **103.** 11–17. **1409**

In the course of an experiment in which *E. rhusiopathiae* was passaged through a series of pigs from 100 to 250 lb. weight, by intracerebral inoculation of fresh infected brain suspension, it was observed that pigs which were susceptible to swine fever showed greater resistance than those which had been immunized against swine fever by crystal violet vaccine.

In a further experiment using ten swine fever immune and five susceptible pigs, seven of the immune pigs died and the remainder showed severe reactions; none of the swine fever susceptible pigs died. *E. rhusiopathiae* was isolated from the blood and spleen of two swine fever susceptible pigs inoculated by the intracerebral route and killed 48 and 72 hours later respectively. *E. rhusiopathiae* could not be demonstrated in the brains of two similar pigs inoculated intravenously.

Using a mouse protection test as a means of assessing production of antibody, D. found an absence of protection in sera from five intracerebrally inoculated swine fever pigs. The serum from one swine fever immune pig which had recovered after a severe reaction, protected four out of five mice at a dose of 0·1 ml.

—J. A. J. VENN.

CECILIA, C. A. (1945.) Contribución al estudio de las intoxicaciones de los quesos. [**Infection from cheese.**]—*Trab. Inst. Biol. anim., Madr.* **8.** 265–290. **1410**

C. reports the isolation of strains of paracolon bacilli from 85 out of 87 samples of cheese, suspected of having caused poisoning. Thirty-five of these strains were pathogenic for g. pigs and mice, and were separated for further investigation. Thirty-one of them were identified as one or other of the varieties of *Bacterium coli*, two were *Bact. oxytocum*, one *Bact. freundii* and one *Aerobacter aerogenes.* The majority of the strains of *Bact. coli* proved fatal when injected subcutaneously into g. pigs, and three proved fatal by ingestion.

The danger involved in eating cheese containing these bacteria can be eliminated by preparing cheese from pasteurized milk.—I. W. JENNINGS.

PENN, K. E. (1947.) **Salmonella infections in mink.**—*Amer. Fur Breed.* **19.** 38. **1411**

There is a recent prevalence of salmonella infections in mink bred on ranches in U.S.A. 65% of the salmonella organisms isolated from such infections were *S. typhi suis*, 21% *S. cholerae suis*, the rest *S. enteritidis* and *S. typhi.* The main symptoms are loose dark stools and a loss of weight. The onset of symptoms is usually sudden, often an animal that seemed in perfect health will drop dead. The disease is spread by infected food, and by flies. Sulphaguanidine and bismuth preparations are advocated for treatment.

—A. MAYR-HARTING.

GLÄSSER. (1944.) Paratyphus-E-Bakterien von Typus anatum beim Kalbe. [*S. anatum* **in the**

calf.]—*Z. Fleisch- u. Milchhyg.* **54.** 145. **1412**

G. isolated *S. anatum* from the flesh of a pig and the organs and flesh of a calf both "emergency slaughtered." It agglutinated weakly with *S. london*, *S. abortus equi* and *S. newport* antiserum. Agglutination was strong only with the O-serum "S" of the Institute of Food Hygiene, Berlin University.—G. HUEHNS.

MACCOLINI, R. (1943.) Ricerche tipo-diagnostiche eseguite sopra una collezione di stipiti di bacteri paratifici isolati in Italia. [**Type identification of a collection of salmonella strains isolated in Italy.**]—*G. Batt. Immun.* **30.** 273–315. [Abst. from French, English and German summaries.] **1413**

462 salmonella strains originating from man, animals and birds, also from meat packings, milk and water were examined and a number identified which had not previously been found in Italy. The biochemical and serological properties of some of the strains are described. The most useful and practical of the techniques available for identifying salmonella are discussed. The constancy of the biochemical properties of certain types was also studied and certain observations offered on the classification of species apparently allied to the salmonella group.—K. J. SINCLAIR.

KAUFFMANN, F. (1944.) Über weitere neue Salmonella-Typen. [**Further new salmonella types.**]—*Acta path. microbiol. scand.* Suppl. No. 54. pp. 33–48. [In German.] **1414**

The author reviews the following :– Type B. *S. coeln*, *S. schwarzengrund*, *S. tennessee* and *S. bonariensis*. Type D. *S. javiana*, *S. new york*, *S. gallinarum*. Type E. *S. simsbury*, *S. taksony*. Other groups. *S. solt*, *S. grumpensis*, *S. mississippi*, *S. heves*, *S. florida*, *S. madelia*, *S. sundsvall* and *S. szentes*.

He gives tables of results of agglutinin-absorption tests and fermentation reactions with certain groups and a table of the antigenic analyses. —A. MAYR-HARTING.

GRAYSON, A. R. (1946.) **Problems of application of strain 19 vaccination in the field.**—*Aust. vet. J.* **22.** 198–201. Discussion : pp. 201–202. **1415**

Vaccination with strain 19 *Brucella abortus* was introduced in 1943 by the Victorian Department of Agriculture. General details of conditions encountered are described. The greatest problems were in whole herd vaccination when adult non-pregnant cows were vaccinated. Vaccination of one or two cows necessitated frequent visits, and agglutination reactions persisted for a very long time—local reactions also occurred.

The confirmation of the presence of brucellosis in each herd before vaccination by the agglutination test was discarded in favour of area confirmation. Some confusion resulted from the inability of farmers to keep adequate records. Lay staff was used as vaccinators after attending a course of instruction. Cases of undulant fever occurred in vaccinators after accidental self-injection.

Vaccination by tail inoculation was discussed. The injection of 0·04 ml. into the tail was said to give an agglutination response similar to that with 5 ml. subcutaneously injected.—D. C. BLOOD.

HARRIS, H. J. (1946.) **Brucellosis. Problems of diagnosis and treatment.**—*Bull. N.Y. Acad. Med.* **22.** 147–165. **1416**

The occurrence, diagnosis and treatment of brucella infections in man is discussed. Many cases appear to remain undetected because of failure or error in interpreting the available tests : agglutination, cultural, intradermal, and phagocytic index tests ; the author emphasizes the need to make such tests in cases of obscure illness and some cases of neurosis. A negative result to one or more of the tests is of little significance, the diagnosis should be based on an interpretation of the results of all the tests.

Arthritis due to brucella infection is specially referred to and two cases and their treatment are described in detail and illustrated.

Good results from the use of a dead *Brucella abortus* vaccine are reported. The administration of vitamin B complex is said to be beneficial in aiding recovery in chronic cases because of its ability to increase the phagocytic power of the white blood corpuscles. Chemotherapeutic agents have proved unsatisfactory.—J. DEANS RANKIN.

RODWELL, A. W. (1946.) **The detoxication of *Cl. welchii* Type D toxin by formaldehyde.**—*Aust. J. exp. Bi l. med. Sci.* **24.** 63–71. **1417**

The conversion of crude *Cl. welchii* type D toxin into toxoid was effected most efficiently by adding 0·5% of formalin, adjusting the pH to 7·0 and incubating for a period of 14 days at 37°C. Loss of combining power was minimal when detoxication proceeded in the region of pH 7·0 and when excessive concentration of formalin was avoided.—D. F. STEWART.

CANHAM, A. S. (1947.) **Spirochaetosis of pigs.** —*J. S. Afr. vet. med. Ass.* **18.** 32–38. **1418**

Attention is drawn to a previous article on spirochaetal wound infection in pigs, see NEITZ & CANHAM, 16*th Rep. Dir. vet. Serv. Anim. Indust. U.S. Afr.*, 1930, in which the lesions were most commonly found on the limbs, testicles, and as large ulcers of the skin. Cases are now recorded in which the organisms were associated with oval superficial ulcers round the eyes, and in the dis-

charge from wounds made in opening haematoma of the ears. It was considered that the spirochaetes were probably secondary wound invaders, and not responsible for the haematomas.

Two outbreaks are recorded in which spirochaetes were detected in the blood of experimental pigs after subinoculation of blood from suspected animals. In one outbreak in the naturally infected pigs there were lesions in the perineal region resembling those of calf ringworms, and in the other the lesions occurred as deep vesicles in the perineal region. No spirochaetes were detected in the lesions, but the sub-inoculation of blood into clean pigs caused a febrile reaction with the appearance of spirochaetes in the blood. Small ring-like bodies were also observed in the erythrocytes. The spirochaetes measured 3μ–10μ, and were much thicker than *Sp. suilla* found in skin lesions ; it is suggested that they may be of a new species. The experimental pigs maintained conditions, and only one out of four developed skin lesions.

A note is added that Prof. Trautmann stated that he had encountered in East Africa a blood spirochaetosis of pigs in areas where human relapsing fever was prevalent.—U. F. RICHARDSON.

BRION, A., & BERTRAND, M. (1946.) L'ictère leptospirosique du chien en France. [**Leptospiral jaundice of the dog in France.**]—*Rev. Méd. vét. Lyon et Toulouse.* **97.** 289–307. **1419**

An account is given of six cases of leptospiral jaundice in dogs at the Veterinary College, Lyon. Leptospira were demonstrable in kidney sections of sub-inoculated g. pigs, but could not be found in material from the natural cases. It is pointed out that the spirochaetes are destroyed soon after the death of the host : the g. pigs were killed at the height of the disease and examined immediately, but the dogs could not be examined until after death and it was not possible to deal with them if they died at times when staff was absent. The examination of urine of both dogs and g. pigs gave negative results. The agglutination titre of the sera of both dogs and g. pigs was low for *L. icterohaemorrhagiae* and the titre of agglutination with *L. canicola* was even lower ; one dog, however, gave agglutination against *L. haemorrhagiae* at 1 : 10,000. It was considered that the organism was *L. icterohaemorrhagiae* in view of the susceptibility of g. pigs to inoculation, and the higher titre of agglutination of this organism, than of *L. canicola.* The failure to get strong agglutination tests is explained as due to the acuteness of the disease, one dog dying within nine days of infection, and g. pigs within about ten days of inoculation, whilst agglutinins only develop after some ten days.

A description given of the symptoms shown by the dogs, and of the P.M. lesions, does not differ from that usually given for leptospirosis ; in two of the cases recent contact with rats had occurred. A good short account of *L. icterohaemorrhagiae* infection in dogs is given, the organism being described, and the epidemiology discussed.—U. F. RICHARDSON.

—. (1946.) **Syphilis. [T. cuniculi in rabbits.]** —*Rep. Rockefeller internat. Hlth Div., 1946.* pp. 122–129. **1420**

It was confirmed that experimental infection of rabbits with *Treponema cuniculi* confers an enhanced resistance, but not complete immunity to infection with *T. pallidum.* The infection of monkeys with *T. cuniculi* is being studied.

—K. G. TOWERS.

SIGUE, N. (1942.) Un cas de peripneumonie chez une antilope-cheval. (Hippotragus equinus). [**Contagious bovine pleuropneumonia in an antelope (Hippotragus equinus).**—*Bull. Serv. zootech. Epiz. A.O.F.* **5.** 91–93. **1421**

During an epidemic in French Nigeria a diseased antelope was found to have severe pulmonary lesions at autopsy. Pleural exudate was injected into two calves, one of which had been immunised previously against bovine contagious pleuropneumonia. The unprotected one sickened and died, while the immunised animal resisted infection. It was concluded that the antelope had been affected with bovine contagious pleuropneumonia and it is pointed out that wild antelopes may function as a reservoir of infection.

—E. KLIENEBERGER-NOBEL.

FILDES, P. (1946.) **The nutrition of bacteria. The work of the Medical Research Council's Unit for bacterial chemistry.**—*Brit. med. Bull.* **4.** 263–266. **1422**

Describes the preliminary work on growth requirements of influenza bacilli, *Cl. sporogenes* and *Salmonella typhi* which led to the formation of the M.R.C.'s Unit for Bacterial Chemistry at the Middlesex Hospital, under the direction of the author, in 1934. During its pre-war existence the Unit established the essential amino-acid requirements of a number of bacteria, and found that thiamine and nicotinamide were necessary also. Studies were made connecting bacterial nutrition with the action of antiseptic and chemotherapeutic agents ; on the action of Hg combining with and inactivating the essential metabolite SH, and the action of sulphonamides and their " antagonisers ". This, for the first time, permitted the making of chemotherapeutic substances along rational lines ; by modifying the structure of an essential metabolite so that it

can no longer function as such, but still uses the enzyme usually employed in its metabolism, the enzyme concerned can be put out of action.

Of the wider aspects of the Unit's work the dependence of nutritional requirements on failure to synthesize is emphasised, and the acquirement of a parasitic mode of life brought in relation to it. The plans for reconstructing the Unit and for resuming work at the Lister Institute are outlined.—A. MAYR-HARTING.

I. KNAYSI, G. (1946.) **On the existence, morphology, nature, and functions of the cytoplasmic membrane in the bacterial cell.**—*J. Bact.* **51.** 113–121. **1423**

II. KNAYSI, G. (1946.) **Further observations on the nuclear material of the bacterial cell.**—*Ibid.* **51.** 177–180. **1424**

I. The author studied spontaneously autolysed organisms in cultures of *B. cereus* and *B. megatherium* and demonstrated what he speaks of as the "cytoplasmic membrane", which according to his findings stains with dyes of the Sudan series, gives the Sharp test for proteins and a positive Feulgen reaction. It is further described as having a jagged inner surface, to surround the cytoplasm proper and to form plane films which separate the cells into compartments and which are supposed to be potential places of cell division. [The accompanying illustrations are indistinct and unconvincing.]

II. Microcultures of a strain of *B. cereus* were subjected to Feulgen's nuclear reaction. In very young cultures only the cytoplasmic membrane and its extensions were found to be Feulgen-positive. Forespores and young endospores stained homogeneously by the author's method, and only the mature spore showed a Feulgen-positive element. From this the author concludes that in the strain investigated nuclear material occurred in the diffuse state only, with the exception perhaps of the mature spore. [These results and conclusions rest entirely on the author's fixation method and Feulgen procedure, the suitability of which for the demonstration of nuclear structures in bacteria seems not to have been tested by him.]—E. KLIENBERGER-NOBEL.

See also absts. **1435** (*B. subtilis* and rabies); **1490** (haemorrhagic septicaemia in cattle); **1492** and **1493** (streptococcal mastitis); **1495** and **1496** (TB.); **1513** (anthrax-infected hides).

DISEASES CAUSED BY PROTOZOAN PARASITES

—. (1947.) Conferência intercolonial sobre tripanossomiases. **[Intercolonial Conference on trypanosomiasis.]** (In Portuguese and English.) pp. 387 & 458. Lourenço Marques: Imprensa Nacional de Moçambique. Vol. I & II. **1425**

This conference was held at Lourenço Marques in 1946, and was attended by delegates from Angola, Bechuanaland, Mozambique, Nyasaland, Kenya and Uganda, Northern Rhodesia, Southern Rhodesia, Swaziland, Tanganyika and the Union of South Africa, the medical, veterinary, entomological, forestry and game departments of the territories being represented. The agenda covered the distribution of tsetse fly in each territory, favourable and adverse environmental factors affecting the spread of vector insects, the distribution of human and animal trypanosomiasis, anti-tsetse measures in each territory, the treatment of human and animal trypanosomiasis, the measures for the control of trypanosomiasis in each territory, the control of migrant labour, the distribution of game and forest reserves, and the exchange of information between territories.

Stress was laid on the difficulty of mapping tsetse-infested areas as they are not static; extensions and regressions render official publications quickly out of date, and yet information as to the presence or absence of tsetse in an area should be available to the public. Many territories admitted that their "fly" surveys were not yet complete. An interesting account was given of the changes which have occurred in tsetse distribution in Southern Rhodesia since the 18th century, and of the factors believed responsible for the freeing of areas, or the extensions of belts. In South Africa it was said that "fly" density was at its lowest in 1938, but the position had deteriorated since 1940, and the extension of the *G. pallidipes* areas since the middle of 1945 had caused much concern. In the Union the occurrence of animal trypanosomiasis was considered to warrant the assumption of the presence of tsetse. It was resolved that in mapping tsetse distribution, the permanent habitats should be indicated, and then in a differential manner the area of maximal dispersal; that the precise localities in which rarer species occur should be indicated by a single symbol; and that the symbols adopted by the East African Standing Committee for Tsetse and Trypanosomiasis Research at the conference of February, 1944, should be used in mapping distribution.

Discussing the favourable and adverse factors affecting distribution it was pointed out that essential tsetse requirements are sufficient heat, food and shade, but that too dense foliage may prevent the obtaining of food. POTTS divided tsetse into primitive species limited to special environments, and more up-to-date species, *morsitans*, *swynnertoni* and *pallidipes*, which have evolved a mode of life which enables them to compete with African man. The latter have

become adapted to annual burning of grass, and any interference with that seems to have an adverse effect, the exclusion of burning in long grass areas leads to a decline in numbers and the presence of unfertilized females.

It was, however, pointed out that the exclusion of fire in the Umfolozi game reserve, to prevent damage to traps, led to the encroachment of bush on the hills, and an extension of "fly" to the Magut area and Swaziland. In using fire to reduce thicket the effect on forests has to be considered. It was suggested that the fly belts which disappeared after rinderpest were those of *G. morsitans* which feeds on large game, whilst *G. pallidipes* which can feed on small game tends to survive.

As regards the distribution of trypanosomiasis the position was described in each area, and it is noted that Southern Rhodesia had viewed the position as regards sleeping sickness with some complacency till 1943, but that now it has been found to have become established in a wide area of the Zambesi valley through which immigrant labour passes. Natives from N. Rhodesia, Nyasaland and Portuguese East Africa have been found infected, and as S. Rhodesia has to import labour disease-free routes must be created. As regards animal trypanosomiasis in most areas this is associated with "fly" belts, and although outbreaks occur in fly-free areas, they are not far enough away to exclude the possibility of fly having been carried there. In S. Africa the sudden appearance of trypanosomiasis some distance from known areas of infestation has been difficult to explain. Since 1945 probably 25,000 cattle have died in an area of 5,000 sq. miles, and information was sought on the importance of mechanical transmission. It was pointed out that mechanical transmission of trypanosomes occurs in India and S. America, and even in tsetse areas appears to increase the severity of the disease. Dr. AIRES gave an interesting description of the conditions in Mozambique where, in the tsetse-infested Maputo area, 57·73% of herds are infected but only about 10·15% of cattle show clinical symptoms, their condition being usually good and the mortality low. Some 40,000 cattle were treated with tartar emetic in 1941 and 1942, but this was abandoned owing to the large numbers which died after treatment.

A note from Kenya records severe mortality in cattle in one area from *T. vivax* infection.

The conference passed a resolution that evidence had been submitted that vectors other than *Glossina* can play a part in transmitting trypanosomiasis, and that "this mode of transmission, commonly known as mechanical transmission, is regarded as being of varying importance in the different territories, and it is recommended that further investigations, particularly in the field, should be undertaken to assess its general importance . . . "

Amongst anti-tsetse measures the method of concentration of population with clearing and improved agricultural methods was fully described by HORNBY, whilst POTTS put in a plea that attempts to use arid grassed woodlands for ranching should not be abandoned, as that would supply animal food products more cheaply than could be done by intensive farming. After describing the approved methods of tsetse control, by isolating areas by clearing and the discriminative clearing of the concentration sites favoured by tsetse, he discusses the experimental methods of fire exclusion which have given promising results in long grass areas, game extermination which is being tested under Tanganyika conditions, and the use of cattle sprayed with D.D.T. as a poison bait for tsetse, which has given some promising results, but may prove better for *G. swynnertoni* or *G. morsitans* than for *G. pallidipes*. He also gave an account of an attempt to eliminate finally a diminished *G. swynnertoni* population by hybridization with *G. morsitans*. From this work it is suggested that the required preponderance of the introduced species may lie between 14 to 1 and 40 to 1, which it is thought may not prove possible economically.

The use of game eradication and control to prevent the spread of *G. morsitans*, and to eliminate it from an area, was discussed by several speakers, an account being given of the successful results in S. Rhodesia, and of the progress made by the application of this method in N. Rhodesia and Bechuanaland.

DU TOIT gives an account of tsetse destruction by the spraying of D.D.T. in the Mkuzi and Umfolozi game reserves by aeroplane, the best results being obtained when the D.D.T. was used as an aerosol, distributed by the hot exhaust gases of the aircraft. This produced a significant drop in the number of tsetse caught in traps in the area under experiment.

The D.D.T. spraying had a marked effect on some beetles and parasitic hymenoptera, but large wasps and bees were resistant. There was a marked effect on mosquitoes and no malaria has occurred in the district since the first spraying.

In the section on the control and treatment of human and animal trypanosomiasis, notes are given on the treatment of human patients with antrypol, tryparsamide, pentamidine and p-arsenophenyl-butyric acid, the last two being ineffective.

In animals though some value was ascribed to tartar emetic, in general the emphasis was on the value of phenanthridinium compounds, the

conference expressed the hope "that greater supplies will be made available to all parts of Africa where it is needed", and that research into the production of more efficacious drugs both for man and animals should receive special attention.

The discussion on the distribution of game and forests drew attention to game as the reservoir hosts of trypanosomes, as the hosts of ticks, and as carriers of rinderpest and foot and mouth disease. It was suggested that game should be maintained in isolated reserves which should not be in tsetse areas, and that the staff for the reserves should include a naturalist, a forestry expert and a veterinary surgeon. It was pointed out that in some territories there would be insufficient fly-free areas to form a game reserve, and that in a fly-belt game provided a valuable meat supply.

The discussion on the exchange of information led to the recommendation that the channels should be the trypanosomiasis commission in Mozambique, the health department and veterinary services in Angola, the health department in Guinea, the Central African Council Secretariat Salisbury and the office of the East African Governors' Conference, Nairobi. The publication of a special bulletin was discussed, and attention was drawn to the value of the *Veterinary Bulletin*. It was emphasized that the *Bulletin* was entirely scientific in outlook and dealt with the literature of all countries impartially.

As addenda, pages 245–282 of Vol. 11 consist of a report by H. E. HORNBY on a survey of the *G. morsitans* belt of the river Save to ascertain the danger of fly extension to the Limpopo river. He concluded that under existing conditions it is doubtful if even a succession of mild dry seasons would allow the fly to extend more than a few kilometres farther south than they are at present. The factor most likely to change the situation for the worse would be an increase in buffaloes and elephants. Notes on the vegetation, stock and game of this area are given.

Pages 315–359 give descriptions of the distribution of tsetse fly in Angola by A. SARMENTO and V. A. S. DIAS.

Pages 359 to 364 record the reaction of *G. brevipalpis* to D.D.T. deposited as a layer on the inside of a tube. Exposure for 15 minutes was fatal. Pages 365 to 392 contain an article by SANTOS on the criteria of cure in the treatment of human sleeping sickness. He points out that treatment need not be so prolonged if commenced in the earlier stages of infection, and gives notes on the interpretation of the results of the examination of the cerebro-spinal fluid for cells and proteins. Pages 393 to 422 contain notes on four cases of the surgical treatment of the blindness following the treatment of sleeping sickness with arsenical drugs, resulting in some improvement in the acuteness of vision, but no widening of the visual field. Pages 423 to 440 give records of the treatment of four cases of human sleeping sickness by the intra-spinal injection of penicillin. It is concluded that penicillin will temporarily remove trypanosomes from the cerebro-spinal fluid, but does not seem to have any action on the evolution of the disease.

Pages 441 to 449 contain a note by DE SOUSA on the treatment of four donkeys and six cattle for *T. brucei* infection. The donkeys were treated with three intravenous injections of 3 g. antrypol given at intervals of 5–7 days. The drug had no ill effects and appeared to be curative, but later two animals relapsed and were re-treated with pentamidine given as eight subcutaneous injections with total doses of 1·9 g. and 2·85 g. respectively. Though the trypanosomes disappeared, the animals became progressively weaker, one being destroyed and the other finally recovering under treatment with tryparsamide given in 7 g. doses intravenously for ten weeks. The cattle were treated with antrypol intravenously and appeared to recover in that their blood had been negative for trypanosomes for seven months. All the subject matter contained in these volumes is given in both Portuguese and English.—U. F. R.

LEONARD, C. S. (1946.) **The immunizing effect in the action of trypanocidal agents. [Correspondence.]**—*Science.* **104.** 556. **1426**

Attention is drawn to recent experimental work affording confirmation of the view that, in the treatment of trypanosomiasis with certain trypanocidal drugs, a response of the host mechanism, an immunizing effect, is a factor in the sterilization of the host, and the view is expressed that trypanocidal drugs, even at concentrations failing to kill trypanosomes, can so alter the metabolism of the parasites as to make them more easily phagocytosed, followed by an immunizing response of the host, which may, however, be only temporary, due to a change in the character of surviving parasites.

It is pointed out that no similar experiments seem to have been carried out after drug treatment of treponema infections and that work with the treponemata of rabbit chancre might elucidate whether the Swift-Ellis subdural neurosyphilis therapy involves immunity factors.—U. F. R.

MOULDER, J. W. (1947.) **Effect of age of infection upon the oxidative metabolism of *Trypanosoma lewisi*.**—*Science.* **106.** 168–9. **1927**

Reproduction of *T. lewisi* in the rat following inoculation only occurs in the first few days of infection. The population is then adult and reproduction is inhibited by a specific antibody.

Determination of oxidative metabolism of the protozoa in the first 2–10 days of infection has shown the adults utilizing glucose take up oxygen at a higher rate, have a higher respiratory quotient and an increased sensitivity to malonate inhibition of oxygen uptake compared with the young reproducing forms. The possible relation between these changes and the inhibition of reproduction by the antibody is being investigated.—K. G. T.

DELPY, L. P., & RAFYI, A. (1947.) La trypanosomiase du dromadaire en Iran. Etude experimentale de *Trypanosoma evansi* (Steel 1885). **[Trypanosomiasis of the dromedary in Iran—experimental study on *Trypanosoma evansi*.]**—*Arch. Inst. d'Hessarek.* No. 5. pp. 33–50. **1428**

T. evansi is common in camels in Teheran, but investigations in the field are impossible owing to the opposition of the owners. The first symptom is oedema of the sternal region, which is usually treated by cautery, and many animals so treated maintain an appearance of health.

An infected camel kept under observation lived for a period of two and a half years with irregular pyrexia occurring two or three times a month. Each rise lasted from three to six days and was often followed by a few hours of subnormal temperature, especially during the last six months. The rise was usually from 36·8° to 38·5°C. and once to 41°C. At first, parasites were fairly common in the peripheral blood, but the numbers reduced as the disease progressed. They were most easily found at the beginning of a temperature rise, but disappeared entirely at its peak. Of three horses experimentally infected, one resisted infection and in the others there were parasites after 6–7 days, death followed in 120–154 days. After six days an ass experimentally infected showed parasites, there were no signs of infection after 20 days, and she gave birth to a normal foal, free of infection, at the 100th day. Of five dogs artificially infected, one died after 81 days, three developed chronic infections and one died on the eleventh day after splenectomy. A cat died six days after infection. Parasites appeared in rabbits 3–15 days after infection, death followed in 16–278 days. G. pigs gave a similar picture as rabbits, but white rats had much quicker reactions, parasites were usually present in less than seven days and death followed in 130 days.—R. MACGREGOR.

TRAGER, W. (1947.) **The relation to the course of avian malaria of biotin and a fat-soluble material having the biological activities of biotin.**—*J. exp. Med.* **85.** 663–693. [Author's summary copied *verbatim.*] **1429**

Biotin deficiency produced by a synthetic biotin-deficient diet was as effective in decreasing the resistance of chickens to infection with *Plasmodium lophurae* as biotin deficiency produced by a diet high in egg white. In moderately biotin-deficient ducks *Plasmodium cathemerium* at first multiplied more slowly than in adequately fed controls. The parasitemia in the deficient animals later overtook that in the controls and attained higher peak parasite numbers. The multiplication of *P. cathemerium* was notably inhibited in ducks inoculated when they were approaching death from biotin deficiency. The total and differential leucocyte count of biotin-deficient chickens did not differ significantly from that of adequately fed controls.

During infection of chickens with *P. lophurae* and ducks with either *P. lophurae* or *P. cathemerium* significant changes occur in the concentration in the plasma of free biotin and of a material which on hydrolysis yields a fat-soluble substance (FSF) having the biological activities of biotin but differing chemically from it. In ducks which survived infections with *P. cathemerium* or *P. lophurae* the biotin concentration rose very early in the course of the infection, before there was any anemia. It fell slightly, rose to a peak at about the time of the peak parasite number, and then returned to normal. The concentration of bound FSF, which was determined in terms of its biotin activity, increased at first, then decreased, then rose and continued at a high level throughout the period of decline in parasitemia. In most of the animals which died of either infection the free biotin, instead of returning to normal, rose to very high values just before death, while the bound FSF, instead of remaining at a high value, fell to very low values, reaching zero in several animals. Greater resistance seemed to be associated with a greater excess of bound FSF over free biotin. In animals about to die the free biotin exceeded the bound FSF. The biotin content of the liver of ducks and chickens fed an adequate diet and killed just after having undergone an infection with either *P. lophurae* or *P. cathemerium* was much less than that of control uninfected animals.

When *P. lophurae* was cultured *in vitro* in suspensions of duck erythrocytes a very wide range in biotin concentration in the culture fluid did not affect its rate of multiplication. Plasma protein fractions relatively rich in FSF at a concentration of 0·75 per cent inhibited multiplication, while comparable concentrations of plasma fractions poor in FSF did not. The results obtained fit the assumption that the substance in plasma which yields FSF is directly concerned in resistance to avian malaria.

CURASSON, M. G. (1941.) Observations sur les "piroplasmoses" en Afrique Occidentale Fran-

çaise. **[The piroplasmoses of French West Africa.]**—*Bull. Serv. zootech. Epiz. A.O.F.* **4.** 22–33. **1430**

Observations at the Dakar Laboratory showed that *Babesia bigemina* was common in W. Africa and is the only piroplasm occurring in cattle in the North Territory. It is usually, but not always, associated with rinderpest or other disease. *Nuttallia equi* has been found to occur in both horses and asses, *P. caballi* appears to be absent. *Theileria parva* and *T. mutans* are both found in cattle and the latter also in antelopes. Three forms of theileriasis are recognized: (1) a chronic form causing wasting, rough hair and enlarged lymphatics, (2) an acute form, (3) a cerebral form, causing "turning sickness" similar to gid; pushing against the wall and great excitement lasting until the animal falls exhausted and dies. This disease was previously thought to be "nervous rinderpest". Anaplasmata have also been recorded, of which the antelope is a reservoir.

—R. MACGREGOR.

NEITZ, W. O., & STEYN, H. P. (1947.) **The transmission of *Babesia canis* (Piana and Galli-Valerio, 1895) to the black-backed jackal [*Thos mesomelas mesomelas* (Schreber)], with a discussion on the classification of the piroplasms of the Canidae.**—*J. S. Afr. vet. med. Ass.* **18.** 1–12. **1431**

Two of three black-backed jackals, approximately six weeks old, were splenectomized after anaesthetization by subcutaneous injection of Bayer's eukodal followed by intravenous injection of pernocton (a barbiturate). It is emphasized that in handling wild animals the use of a narcotic, such as morphine or eukodal eliminates excitement and struggling during the intravenous injection, and thus avoids the risk of respiratory failure which might be caused by the too rapid administration of the barbiturate during the period of excitement. During the ensuing three weeks the only blood parasite detected was *Hepatozöon canis*, indicating that the jackals had been in contact with *Rhipicephalus sanguineus*, but had not become infected with *Babesia canis*.

The two splenectomized jackals were inoculated with the blood of a dog with babesia infection, and this resulted in the appearance of *B. canis* in their blood three days later. The third jackal also developed a *B. canis* infection when inoculated with blood from one of the splenectomized animals, and the infection was transmitted back to dogs from the jackals.

It is noted that during the period of observation the jackals showed continuous hyperthermia varying from 103° to 107° F., but it is uncertain whether this is normal or not. More than three years after the artificial infection *B. canis* could still be demonstrated in the blood of the splenectomized jackals, but not in the non-splenectomized one.

It is concluded that *B. canis* is not specific for the dog, and that there is reason to believe that this characteristic is shared by other *Babesia* recorded from various species of Canidae.

Discussing the *Babesia* of dogs it is considered that there is no doubt that *B. canis* and *B. gibsoni* are distinct species, but that there is insufficient information to reach a definite conclusion as to the position of *Rangelia vitalii*. It is considered that *B. rossi* is a synonym of *B. canis*, and that parasites described from wild dogs in India, wolves and foxes in Russia, and foxes in Africa, are probably all, in reality, either *B. canis* or *B. gibsoni*.—U. F. RICHARDSON.

PIERCY, S. E. (1947.) **Hyper-acute canine babesia (Tick fever) [Babesiasis].**—*Vet. Rec.* **59.** 612–613. **1432**

A six-months-old Great Dane puppy born and reared in an area in which canine babesiasis was enzootic contracted the disease in a form so acute that death followed within 12 hours. P.M. examination suggested that death occurred as a result of cerebral babesiasis, smears from various parts of the brain showing that many capillaries and smaller arterioles were occupied by parasitized erythrocytes and some vessels appeared completely blocked. Sections of the cerebrum and cerebellum showed marked congestion with extensive haemorrhages in some areas.

There were no signs of anaemia or jaundice but blood smears stained with Giemsa showed that 22% of erythrocytes were invaded by parasites.—S. BRIAN KENDALL.

PIERCY, S. E. (1947.) **Immunity to East Coast fever.**—*Vet. Rec.* **59.** 636. **1433**

This records the unusual circumstance of a death from East Coast fever in an animal which had acquired the disease at one month, recovered, and then lived under enzootic conditions for two years. The subject, a grade Ayrshire bull, at P.M. had classic lesions and Koch's blue bodies were visible in the spleen together with *Babesia bigemina* and *Anaplasma marginale*.

Usually it is considered that recovery from East Coast fever gives a solid immunity which, however, may be dependent on some degree of exposure to the disease.—S. BRIAN KENDALL.

See also absts. **1484** (course of disease in turkeys); **1497-1502** (chemotherapy of trypanosomiasis); **1503** (diamidine for piroplasmosis); **1544** (dourine); **1549** (veterinary protozoology—a text-book).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

HENDERSON, W. M. (1947.) **Vesicular lesions in farm animals.**—*Vet. Rec.* **59.** [No. 37.] 497–498. **1434**

An approximate guide is given to the age of the tongue lesions of foot and mouth disease in cattle and the foot lesions in pigs. The American diseases vesicular stomatitis and vesicular exanthema produce lesions which simulate those of F. & M. disease, but there is no record of their isolation in Great Britain. The main features distinguishing the three diseases by animal inoculation are tabulated and reference is made to their behaviour in natural outbreaks.

—K. G. TOWERS.

CHASSIGNEUX. (1945.) *Bacillus subtilis* et virus rabique. [*B. subtilis* **and rabies virus.**]—*Bull. Acad. vét. Fr.* **18.** 295–299. **1435**

Attempts in French West Africa to fix the rabies virus of Senegal have not been successful, and fixed virus of the Pasteur Institute of Paris often loses its virulence in this area at the fourth passage. Experimenting with three strains of the rabies virus C. found that a considerable number of inoculated rabbits failed to contract rabies, though on re-inoculation they proved to be susceptible.

He suggests that this failure to infect is due to contamination of material with *B. subtilis* which he succeeded in isolating from the nervous tissue of rabies-resistant rabbits, the climatic conditions at Dakar, particularly the moist, warm, conditions in October, favouring this organism.

The information on the antibacterial and antitoxic properties of *B. subtilis*, and extracts made from it, is reviewed, and C. claims to have seen an article, which he thinks was by MARIE, reporting that the inoculation of *B. subtilis* with the rabies virus prevented the development of rabies.—U. F. RICHARDSON.

HARE, R., & CURL, M. (1947.) **Adsorption of influenza virus.**—*Canad. J. Res.* Sect. E. **25.** 43–52. **1436**

Although adsorption of influenza virus on red cells and its elution with saline has proved a practical and widely used procedure in the manufacture of vaccine, it would be desirable to have an absorbing agent that could be sterilized and that unlike red cells would not be damaged by formalin. This paper presents the results of a search for such an agent. It was found that influenza A and B virus in allantoic fluid could be adsorbed by certain grades of diatomaceous earths; there was a marked degree of correlation between the "flow rate" of the earths and their ability to absorb the virus. Kaolin, fullers' earth, and certain varieties of charcoal also adsorbed the virus which could be eluted in broth, serum or isinglass; the highest yield of virus was obtained by adsorption on silica earths and subsequent elution with isinglass solution. The addition of formalin, 1 : 500, or merthiolate, 1 : 20,000, did not prevent adsorption or elution. The eluted virus retained its antigenicity as shown by immunization experiments in mice.—C. E. RICE.

HIRST, G. K. (1947.) **Comparisons of influenza virus strains from three epidemics.**—*J. exp. Med.* **86.** 367–381. [Author's summary copied *verbatim.*] **1437**

Some of the peculiarities of strains of influenza A and B virus from two epidemics have been described. The influenza B virus of 1945–46, when compared with influenza A virus, proved to be much more difficult to isolate from human sources by any known means. Its adaptation to the chick embryo (by any route) or to mice was much slower than that of A virus. It did not keep nearly as well on storage at –72°C. either in throat garglings or as passage material. Its adaptation to amniotic growth was usually much better than to allantoic growth even after repeated allantoic passages. It failed to show primary evidence of occurring in the O form, although many of the secondary O characteristics were present and persisted. Its titer in throat washings was not demonstrably high as compared with certain strains of A virus, which were demonstrated in garglings at dilutions of 10^{-5} and 10^{-6}.

The antigenic pattern of influenza A strains from two epidemics were compared. No antigenic differences of significant degree were found among the strains of either epidemic and the difference between the strains of the two epidemics was very slight. A similar study was made of the influenza B strains of the epidemic of 1945–46. This also showed complete lack of significant strain differences. The implications of these findings for influenza prophylaxis are discussed.

PECK, J. L., Jr., & SABIN, A. B. (1947.) **Multiplication and spread of the virus of St. Louis encephalitis in mice with special emphasis on its fate in the alimentary tract.**—*J. exp. Med.* **85.** 647–662. [Authors' summary copied *verbatim.*] **1438**

Beginning at 24 hours after intravenous injection of about 10 million intracerebral LD_{50} of virus there was evidence of simultaneous, progressive multiplication in the brain and intestinal tract. When the virus was introduced directly into the brain or the nasal cavities and mouth, none was found in the intestinal tract

until there was general centrifugal spread from the central nervous system during the last stages of the infection at 96 or 120 hours after inoculation when the virus in the entire brain had reached a concentration of about 3 billion LD_{50}. Centrifugal spread began when the virus in the brain reached a concentration of about 400 million LD_{50} and virus appeared in the pharynx, tongue, and adrenals before it was demonstrable in the intestinal tract, blood, or viscera such as the spleen, liver, and kidneys. Despite the high concentrations of virus which developed in the intestinal tract following intravenous inoculation, it was not demonstrable in the stools, differing in this respect from Theiler's virus in mice and poliomyelitis virus in human beings and monkeys. No antiviral agent was found in the stools, but the urine of normal mice having a pH of 5·6, inactivated large amounts of St. Louis encephalitis virus. There was no evidence of multiplication in the nasal mucosa of mice which succumbed with encephalitis following nasal instillation of the virus, the course of events being comparable in this respect to the behavior of the M.V. poliomyelitis virus in *rhesus* monkeys. At the terminal stage of infection the virus content per milligram of tissue was as great in the leg muscles as in sciatic nerves. Since this was also true for the urinary bladder, heart, lungs, and tongue among other tissues, and since the amount in the blood was too negligible to account for it, it would appear that the virus either accumulated in these tissues by diffusion from the nerve fibers, along which it was spreading from the central nervous system, or that it multiplied in some constituent other than the nerve fibers.

RACKER, E., & KRIMSKY, I. (1947.) **Relation of iron salts to inhibition of glycolysis by Theiler FA virus of mouse encephalomyelitis.**—*J. exp. Med.* **85.** 715–727. [Authors' summary copied *verbatim.*] **1439**

Brain homogenates of mice infected with the Theiler FA strain of mouse encephalomyelitis virus show marked inhibition of glucose phosphorylation. A similar effect can be obtained by incubating normal brain homogenates with small amounts of ferrous sulfate. Partially purified preparations of Theiler FA virus contain iron in amounts corresponding to their inhibitory effect on brain glycolysis. The virus preparations were purified by chemical fractionation and differential centrifugation and were dialyzed against potassium cyanide or pyrophosphate and potassium chloride for several days before they were analyzed for iron content. The inhibitory effect of the virus preparations and of ferrous sulfate has been shown to be dependent on a heat-labile factor present in normal brain (" inactivating factor "). The glycolytic activity of brain homogenates of mice infected with the Theiler FA virus can be restored by addition of a factor prepared from rabbit muscle extract. This " restoring factor " is non-dialyzable and is heat-labile. It has no hexokinase or phosphohexokinase activity. Its restoring activity is destroyed by the " inactivating factor " present in brain.

LENTZ, W. J. (1946.) **Canine encephalitis, myelitis, and meningitis.**—*Vet. Ext. Quart. Univ. Pa.* **47.** 13–19. **1440**

This is principally an account of the nervous complications of canine distemper. The symptoms and course of the nervous form of the disease are elaborated and appropriate pharmacological treatment is indicated.—K. G. TOWERS.

GORET, P., MÉRY, F., LAMOUROUX, J., & LEBEAU, A. (1947.) Sur les formes cliniques de la maladie de carré. Existe-t-il, en France, plusieurs maladies du " jeune âge " ? [**Variations in clinical symptoms of distemper in France.**]—*Bull. Acad. vét. Fr.* **20.** 303–314. **1441**

Variations from the classical form of distemper lead to the suggestion that other diseases may be involved. The variable clinical forms of distemper in dogs are discussed, and also the occasional susceptibility of animals up to eight years, reinfection after recovery from distemper-like disease and breakdown in vaccination. The inability sometimes noted to infect ferrets with material from dogs may be due to field attenuation (for the ferret) of a particular virus.—S. B. K.

VOLKERT, M., & HORSFALL, F. L., Jr. (1947.) **The effect of sulfhydryl groups on pneumonia virus of mice (PVM).**—*J. exp. Med.* **86.** 383–391. [Summary copied *verbatim.*] **1442**

Evidence is presented which indicates that PVM is affected adversely in concentrated lung tissue suspensions or in the presence of glutathione. Because iodoacetamide inhibits or eliminates these effects in a similar manner, it is concluded that sulfhydryl groups are essential to their development.

GARD, S. (1944.) **Tissue immunity in mouse poliomyelitis.**—*Acta med. scand.* **118.** 27–46. [In English, author's summary copied *verbatim.*] **1443**

Brain suspension from mice, surviving an attack of poliomyelitis induced by a strain of virus of low virulence and subsequently immune to reinfection, protects against infection when injected intracerebrally together with active virus. Normal brains do not possess this property.

The protective power is not dependent upon the virus content of the preparations and must, consequently, be attributed to the presence of a

specific inhibitor. This inhibitor is attached to the tissue component of the suspension and is not soluble in distilled water or saline solutions. It does not combine with the virus *in vitro*.

The appearance of the inhibitor in the tissue coincides with the onset of symptoms.

A protective effect is obtained also after intraperitoneal administration of immune brain suspension, although less pronounced. The optimal effect is attained when treatment is given 24 hours before the test inoculation.

DINTER, Z., & DINTER, H. (1944.) Pokusi uzgajanja virusa klasične i atipične kuge peradi Marchouxovom metodom. [**Cultivation tests with classical and atypical fowl plague viruses.**] —*Vet. Arhiv.* **14.** 363–370. [Abst. from German summary.] **1444**

Cultivation *in vitro* by Marchoux' technique was attempted, 5 ml. nutrient agar was placed in a test tube and allowed to solidify. 1·8 ml. normal defibrinated hen's blood (normal blood) and 0·2 ml. of similar blood containing virus (initial blood) were introduced. The normal blood sample was fresh and the initial blood was stored for 30 days at 0°C. before use. Two typical and three atypical strains of virus were used. After 1–3 days incubation of the first tube at 37°C., 0·2 ml. blood was transferred from it to a second tube containing 5 ml. nutrient agar and 1·8 ml. normal blood. The virus strains were passaged in this way 20 or more times. Blood from the final passage or serum from it was injected intramuscularly into hens, with the result that they invariably died of typical or atypical fowl plague depending on the virus strain used.

The dilution of the initial virus blood sample after 20 passages is 10^{-20}; since a virus at this dilution could no longer be infective *per se* it must have multiplied. Confirmatory evidence of this was obtained in the control experiments.

—K. J. SINCLAIR.

ANON. (1946.) Dell'epizoozia dei polli. [**Newcastle disease in Italy.**]—*Clin. vet., Milano.* **69.** 181–183. **1445**

Simultaneous outbreaks of laryngo-tracheitis and Newcastle disease are described. For immunization against laryngo-tracheitis cloacal scarification with virus attenuated by drying was used and for Newcastle disease an aluminium hydroxide adsorbed vaccine prepared from virus cultivated on the chick embryo. The possible relationship between the two diseases is discussed.

—F. A. ESTEVES.

TILLEY, F. W., & ANDERSON, W. A. (1947.) **Germicidal action of certain chemicals on the virus of Newcastle disease (avian pneumoencephalitis).**—*Vet. Med.* **42.** 229–230. **1446**

Equal volumes of amnio-allantoic fluid of embryos which had died of Newcastle disease were mixed with solutions of disinfectants. Samples were withdrawn at 5, 10, 15, 30, 60 min. and tested for infectivity for chick embryos. Under the conditions of the experiment the following disinfectants were effective, sodium hydroxide 2% sodium orthophenylphenate 1·0%, liquor cresolis saponatus U.S.P. 1·0%, and two quarternary ammonium compounds 0·1%. The following disinfectants were ineffective, isopropyl alcohol 50%, ethylene glycol 100%, sodium carbonate 4%.

Formalin appeared to require a considerable time to destroy the virus. A calcium hypochlorite of high alkalinity failed to inactivate the virus.

—F. D. ASPLIN.

—. (1946.) **Other respiratory diseases.**—*Rep. Rockefeller internat. Hlth Div., 1946.* pp. 83–88. **1447**

A new filtrable virus has been obtained from human cases of atypical pneumonia. Serologically it is an entity distinct from other pneumonia viruses such as the influenza and psittacosis groups. Cotton rats and hamsters have been actively immunized against the virus.

The pneumonia virus of mice has been obtained free from tissue particles by a centrifugation technique.

Penicillin has been found to suppress murine and feline pneumonitis infections of the yolk sacs of chick embryos. When given intraperitoneally to mice it has been found to inhibit the pneumonia virus. It is claimed this is the first time that penicillin has completely inactivated a virus "*in vivo*."—K. G. TOWERS.

HAMMON, W. McD., MACK, W. N., & REEVES, W. C. (1947.) **The significance of protection tests with the serum of man and other animals against the Lansing strain of poliomyelitis virus.** —*J. Immunol.* **57.** 285–299. **1448**

The data so far collected upon such tests is presented without attempt at final interpretation. Neutralizing bodies against this virus have been found more commonly in domestic animals in contact with man than in those in desert areas or in wild mammals or birds. Experimentally a virus antigenically related to the Lansing strain produced antibodies in monkeys, cotton rats and hamsters, while three other strains failed to do so.

Chicken sera behaved irregularly and virus was not recovered from chicken faeces after feeding or inoculating the virus. Human sera from the early acute phase of poliomyelitis infection and from the convalescent stage showed that most cases had a high initial titre or showed no change. Antigenic differences in the virus strains

probably affect the tests and it is not established that all Lansing antiviral substances demonstrated are due to contact with poliomyelitis virus.

—K. G. TOWERS.

MORNET, M. P. (1942.) Existence de " Rickettsia canis " au Niger. [**Rickettsia canis infection in French West Africa.**]—*Bull. Serv. zootech. Epiz. A.O.F.* **3.** 219–220. **1449**

Rickettsial invasion of the monocytes is recorded in two dogs of European breed in French West Africa. The symptoms in both animals consisted of weakness, inappetence, fever, congestion of the oral and buccal mucous membranes, breathlessness and an occasional dry cough.

One animal recovered under symptomatic treatment, the other improved after an intravenous injection of acriflavin, but a second injection caused vomiting, and in spite of careful nursing the animal died ten days later.

—U. F. RICHARDSON.

RICE, C. E. (1947.) **A survey of elk and buffalo herds for serologic activity with two rickettsial antigens.**—*Canad. J. comp. Med.* **11.** 299–301. **1450**

The sera from 185 elk and 36 buffalo killed in two National Parks in the Province of Alberta were tested by complement fixation tests with Rocky Mountain spotted fever and American Q fever antigens. No significant reactions were obtained.—P. J. G. PLUMMER.

See also absts. **1409** (susceptibility of swine fever-immune pigs to *E. rhusiopathiae*); **1504** (distemper vaccine); **1509** (anaesthesia and virus infections); **1512** (aerosol disinfection of viruses); **1545** (equine infectious bronchitis).

IMMUNITY

PARKES, A. S. (1947.) **The antigenic properties of iodinated proteins.**—*J. Endocrinol.* **5.** 49–58. **1451**

Rabbits were injected daily for long periods with iodinated plasma, iodinated ardein (ground nut protein) or iodinated casein. The sera of such animals gave a precipitin reaction with the heterologous as well as with the homologous antigens, the vigour of the heterologous reaction being roughly proportional to the biological activity of the antigen. These sera did not react with thyroid preparations. Similar antisera were produced against preparations of the thyroid glands of various species. These reacted well with thyroid antigens but negligibly or not at all with iodinated proteins. Precipitates from reactions between iodinated proteins and antisera thereto, showed only a small amount of the total activty of the antigen. Attempts to effect passive immunization of tadpoles by treatment with antiserum were unsuccessful.—J. M. R.

See also absts. **1409** (susceptibility of swine fever-immune pigs to *E. rhusiopathiae*); **1415** (strain **19** vaccinefor brucellosis); **1426** (trypanosomiasis); **1433** (East Coast fever); **1443** (tissue immunity in poliomyelitis); **1448** (protection tests with poliomyelitis virus); **1504** (distemper vaccine).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

LAWRENCE, D. A. (1946.) **Tick transmission of disease.**—*Rhod. agric. J.* **43.** 404–407. **1452**

L. reviews the known life histories of various Ixodidae in relation to the part which they play as vectors of animal diseases.—S. BRIAN KENDALL.

See also absts. **1425** (trypanosomiasis and tsetse fly); **1505** (treatment of mange).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

KAPLAN, M. M., & SAKELLARIOU, S. (1947.) **The effect of hexachlorethane-bentonite suspension on the lancet fluke** *Dicrocoelium lanceolatum.*—*Vet. Med.* **42.** 23–24. **1453**

As a preliminary test before using hexachlorethane for fascioliasis in sheep in Greece the authors selected five clinically affected sheep and dosed each of them with 15 g., given as a 9 : 1 mixture with bentonite, suspended in water. The sheep were killed 92 hours later and hundreds of liver and lancet flukes were found dead in their livers. It is also stated that immature liver flukes were also found dead. [Immature liver flukes (*F. hepatica*) are generally considered to be resistant to hexachlorethane and lancet flukes (*Dicrocoelium lanceolatum*) doubtfully resistant, at best.]—J. E.

KITCHELL, R. L., CASS, J. S., & SAUTTER, J. H. (1947.) **An infestation in domestic turkeys with intestinal flukes.**—*J. Amer. vet. med. Ass.* **111.** 379–381. **1454**

About 6% of a flock of turkeys were ill because of infestation with *Echinostomum revolutum*; 20% were off their food, but only a small number of deaths occurred. Diarrhoea was a common symptom and the entire flock was unthrifty. At autopsy affected turkeys were found to be dehydrated; the lower colon, rectum and caecal tubes were enlarged and congested and the intestinal walls were thickened; the mucosa

was coated with a thick slimy grey exudate and by immersing in water flukes were easily observed. Carbon tetrachloride, administered per rectum, was used with some success as a treatment. The authors give a brief description of the life cycle of the parasite and of the part played by its intermediate host, the snail *Helisoma trivolis*. The control of the parasite by an attack on its host is discussed.—J. B. Blaxland.

Miller, M. J. (1947.) **Studies on the life history of *Trichocephalus vulpis*, the whipworm of dogs.** —*Canad. J. Res.* Sect. D. **25.** 2–11. **1455**

Embryonated eggs of *T. vulpis* hatched in the upper part of the small intestine of dogs as soon as half an hour after ingestion. Many newly hatched larvae were destroyed by being swept from the intestine with the faeces. Others penetrated deep into the mucosa of the small intestine and did not return to the lumen for at least eight days. There is, apparently, no migration of larvae in body tissues outside of the alimentary tract. No moult was observed in larvae less than ten days old, and it appears that this process does not occur until later (probably after passive migration to the large intestine). Only minor destruction of host tissue cells was observed.—W. E. Swales.

Ammann, K. (1947.) Onchocercen als Ursache von Lahmheiten, Widerrist- und Genickfisteln beim Pferd. [**Onchocerca infestation a cause of lameness and fistulous withers in the horse.**] —*Schweiz. Arch. Tierheilk.* **89.** 325–338. **1456**

In five cases, *Onchocerca* species were found to be the cause of fistulous withers and bursitis in the horse. The course of the disease was prolonged. In all five cases, *Brucella abortus* agglutination tests were positive, but the organisms were not demonstrated on culture of the lesions after death. The worm was not found in the course of macroscopic examination, but was demonstrated in sections of necrotic tissue in all cases; in some there was encapsulation and calcification. Several species of *Onchocerca* and intermediate hosts seem to be involved, but as the parasites were demonstrated only in section, identification was not possible.—A. Loosmore.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Sannié, C., Truhaut, R., & Guérin, P. (1940–1941.) Production de sarcomes chez la souris par injections d'un extrait obtenu à partir de foies de malades cancéreux. [**Production of sarcoma in the mouse by injections of an extract from the liver of cancer patients.**]—*Bull. Ass. franc. Cancer.* **29.** 106–121. [Abst. in *Cancer Res.* **6.** 92, slightly amended. Signed: G. H. H.] **1457**

Human desiccated liver was extracted with benzol, the extract was saponified, and the unsaponifiable fraction dissolved in olive oil. Extracts were taken: (1) from 2 patients with buccal and vaginal epithelioma respectively, and no liver metastases, and (2) from patients dead of other (unspecified) causes. Twenty-five mice received extract (1), 25 mice received extract (2), and 25 controls received olive oil; injected subcutaneously in the back, the dosage was 0·3 ml. per week for 2 months. Among the mice receiving extract (1), 6 developed subcutaneous sarcomas, and 6 others had tumors in one or more of the following sites: mammary gland, lung, fallopian tube, pancreas, liver. Only 1 mouse had pulmonary adenomas. Three neoplastic livers but no subcutaneous sarcomas occurred in the mice receiving extract (2), and an inflammatory lesion in 1 liver was found in the control group. The subcutaneous sarcomas appeared only after 12 to 20 months; hence their incidence should be considered on the basis of the number of animals in each group surviving more than 1 year, *i.e.* 20, 20, and 15 respectively, rather than on the basis of the number of animals at the beginning of the experiment. Twelve subcutaneous cysts developed after injection of extract (1) and 5 after extract (2).

Platt, W. R. (1947.) **Effects of radioactive phosphorus (P^{32}) on normal tissues. A histologic study of the changes induced in the organs of patients with malignant lymphomas.**—*Arch. Path.* **43.** 1–14. [Author's summary copied *verbatim.*] **1458**

The beta emanations of radioactive phosphorus (P^{32}) produce characteristic changes in many body tissues, alterations which vary in intensity but are similar to those produced by other types of radiation.

The lesions observed are the resultant of several diverse cellular, intercellular and vascular changes. Prominent specific features are varying degrees of cellular death, abnormal mitoses producing giant irregular nuclei, fibrosis, hyalinization of collagen and a vascular alteration characterized by thickening and hyalinization of small blood vessels.

There is a selective localization of larger quantities of radioactive phosphorus and greater injury in the tissues most often involved by the neoplastic cells of malignant lymphomatoses and myelomatoses, i.e., marrow, liver, spleen and lymph nodes. Changes were also demonstrated in lungs, kidneys, gastrointestinal tract, ovaries and testes.

NUTRITIONAL AND METABOLIC DISORDERS

SWIFT, R. W., THACKER, E. J., BLACK, A., BRATZLER, J. W., & JAMES, W. H. (1947.) **Digestibility of rations for ruminants as affected by proportions of nutrients.**—*J. Anim. Sci.* **6.** 432–444. **1459**

The effect of various supplements on the digestibility of a ration was studied using crude fibre, ether extract, protein, carbohydrate and urea. Oat straw was used as a source of crude fibre while the other fractions were supplied as chemically prepared substances.

Three groups, each of five Hampshire yearling lambs were selected for uniformity. Six treatments were tested, two on each group. Each treatment was split into three dose levels which were divided in time by a ten-day preliminary period, then the ten-day treatment period, followed by a ten-day rest period. The faeces were collected during the treatment period and analysed for the various food fractions.

The addition of crude fibre reduced the digestibility of all other fractions but the total dry matter digested was increased. Additional carbohydrate reduced the amounts of crude fibre and digestible protein digested. Casein improved the digestibility of other proteins, and reduced that of the nitrogen free extract. Urea also was found to increase the digestibility of proteins.

Evidence of the use of the "lignin ratio" method of determining the digestibility of food fractions is presented.—G. L. BAILEY.

MCCLYMONT, G. L. (1947.) **Nutritional deficiencies of poultry in New South Wales.**—*Aust. vet. J.* **23.** 22–25. **1460**

This review article deals with effects of deficiencies on growth, egg production and hatchability in poultry. The effects of deficiency of vitamin A, of vitamin D and calcium (rickets), of riboflavin (curled toe paralysis) and of protein and energy in the ration have been observed in the field in N.S. Wales. Perosis, probably due to choline deficiency is common in turkeys and dermatitis probably of nutritional origin has been noted. No outbreaks of nutritional encephalomalacia have been encountered. Egg production is rarely affected by any known deficiencies. Regarding hatchability, riboflavin deficiency is most important and was particularly so during war-time shortages. Synthetic riboflavin is now commonly used in breeding rations. Manganese deficiency may operate occasionally.—L. HART.

PARSONS, E. I., MCCOLLUM, E. V., & FROBISHER, M., Jr. (1946.) **The effect of dietary carbohydrates on the dental flora of the rat.**—*Amer. J. Hyg.* **44.** 249–256. **1461**

Rats of both sexes, 2–3 months old were given a basal diet containing dried kidney, yeast, fat, minerals and vitamins A and D. Their dental flora was examined at intervals up to about 200 days and compared with that of rats fed on the same diet supplemented with sucrose, lactose, raw starch, or cooked starch at levels ranging from 10–60%. Both aerobic and anaerobic cultures were made. The diets containing 40% and 60% of carbohydrates produced toxic effects, which were caused not by the carbohydrate *per se* but by its combination with the dried kidney preparation. The latter was replaced by whole-egg powder in later experiments. The numbers of non-acidogenic cocci in the crypts and fissures of the teeth were similar on both basal and experimental diets, but all levels of carbohydrate used greatly increased the numbers of acidogenic cocci. Lactose and raw starch both favoured the growth of lactobacilli to some extent, but these organisms never amounted to more than a quarter of the total acidogenic cocci population.

—E. M. CRUICKSHANK.

PURCHASE, H. S., & REVERBERI, A. A. (1946.) **The constituents of the solids-not-fat of Kenya milk.**—*E. Afr. agric. J.* **12.** 50–52. **1462**

Examination of the solids-not-fat content of bulk samples of milk in Kenya showed a much higher incidence of figures below the presumptive legal minimum of 8·5% during the dry season, when grazing was parched and concentrates were being fed heavily, than during the rainy season when cows were grazing on ample pasturage of good quality. Lactose, determined by a difference method, appeared to be the constituent responsible for the deficiency level in the milk. The deficiency appeared to be more prevalent in Friesian and Ayrshire cows than in other breeds, including native ones, common to the locality.—A. EDEN.

TEMPERTON, H., & DUDLEY, F. J. (1947.) **The effects of feeding iodinated casein to laying hens.**—*Harper Adams Util. Poult. J.* **32.** 20–25. **1463**

Studies were made of the effect of adding varying amounts of an iodinated casein preparation (1·46% acid-insoluble iodine) to the diets of laying hens in their second year, in order to determine whether (a) additional thyroid active material would promote a metabolic rate comparable with that of pullets and lead to an increased egg output; (b) such thyroid active material would alter the seasonal distribution of annual egg production.

In all cases the response was negative; over a period of 14 months the control groups had laid more eggs than any of those receiving iodinated casein. A natural decline in intensity of egg production over the last six months was noticed in all groups, with no significant differences

between them. There was no indication that the levels of iodinated casein fed were excessive, and there were no significant differences in respect of loss of body weight or in mortality rate attributable to the level at which iodinated casein was fed.

—A. EDEN.

PATTERSON, J. M., & MCHENRY, E. W. (1944.) **Choline and the prevention of hemorrhagic kidneys in the rat. III. Amounts of water, nitrogen, total lipid, and choline in livers and kidneys.**—*J. biol. Chem.* **156.** 265–269. [For part II, see *V. B.* **15.** 367.] **1464**

During a period of ten days after weaning the rate of turnover of phospholipoid in rats is much greater than in older animals. During this period, a deficiency of choline in the diet caused renal lesions characterized by large increases in the water, nitrogen and fat and diminution of the phospholipoid content of the kidneys. The diminution of phospholipoid was apparent on the seventh day, before renal lesions made their appearance. The amount of choline in the kidneys of the deficient rats was decreased by an amount which maintained the same ratio of choline to phospholipoid as in the normal rats. Similar changes in composition were observed in the livers of the deficient animals. These results indicated that a decreased formation of phospholipoid in choline deficiency was the cause of the renal damage.—R. MARSHALL.

RIDOUT, J. H., LUCAS, C. C., PATTERSON, J. M., & BEST, C. H. (1946.) **Lipotropic factors and the fatty liver produced by feeding cholesterol.** —*Biochem. J.* **40.** 494–499. **1465**

The lipotropic effect of choline persists even when rats are fed a diet containing 0·5% of cholesterol for 16 weeks. Inositol was almost as effective as choline in decreasing glycerides or cholesteryl esters. On prolonged feeding, inositol became less effective. Combined supplements of choline and inositol had a definite synergistic effect, but inositol did not prove to be more active in decreasing cholesteryl esters. When the rats were submitted to a preliminary vitamin B_1 deficiency, choline had a greater lipotropic activity than inositol.—E. KODICEK.

MITCHELL, H. H. (1947.) **The mineral requirements of farm animals.**—*J. Anim. Sci.* **6.** 365–377. **1466**

The functions of the minerals essential to the metabolism of farm animals are discussed, with particular reference to the needs for calcium and phosphorus.

Data collected from many sources, giving the variable quantity of the mineral requirements and their ratio relative to each other, according to the age and sex of the animals, for Holstein heifers and Percheron colts, fattening and pregnant sows, Shropshire lambs and White Leghorn chickens.

—G. L. BAILEY.

ARCHIBALD, J. G. (1947.) **Cobalt in cows' milk.** —*J. Dairy Sci.* **30.** 293–297. **1467**

In two groups of cows, each consisting of an Ayrshire, a Guernsey, a Holstein and a dairy Shorthorn, three of the breed pairs were matched with respect to stage of lactation, none being beyond the 12th week of lactation; the Shorthorns were not a matched pair being at the 8th and 18th week of lactation respectively. One group received a supplement of 500 mg. cobaltous acetate during December and January and the other group during February and March. Other rations and management of the two groups were identical. Cobalt was determined colorimetrically on composite 2-day samples of milk.

The amount of cobalt occurring naturally in these averaged 0·6 μg. per litre, range from 0·2–1·14 μg. per litre. There was a tendency for the amount of cobalt to diminish as the season advanced. All cows receiving cobalt supplements had higher values than their breed mates on the non-supplemented ration, the average increase being fourfold. The only consistent breed difference was the relatively low values for Holstein milk, whether on the control or supplemented ration.

As young stock are more susceptible to the nutritional anaemia characteristic of cobalt deficiency in areas where cobalt deficiency is common the requirement of calves for this element could be supplied by supplementing the ration of the cows supplying the milk.—ALAN A. WILSON.

DE MAN, TH. J., & GRASHUIS, J. (1947.) Vitaminen in enkele belangrijke voedermiddelen. **[Vitamins in important foodstuffs.]**—*Tijdschr. Diergeneesk.* **72.** 107–109. **1468**

The authors tabulate average vitamin content data for livestock foodstuffs. The vitamins include A, carotene, thiamine, riboflavin, niacin, pyridoxine, pantothenic acid, C, D and E. The foodstuffs are maize, oats, wheat, rye, barley, wheat flour, wheat germ, soya meal, linseed meal, groundnut meal, cow's milk, milk powder, meat meal, fish meal, dried brewers' yeast, dried bakers' yeast, potato, carrots, grass and cod liver oil.—J. E.

FROST, D. V., DANN, F. P., & MCINTIRE, F. C. (1946.) **Adequacy of the known synthetic vitamins for normal feathering and pigmentation in chicks.**—*Proc. Soc. exp. Biol., N.Y.* **61.** 65–69. **1469**

Day-old Black Leghorn chicks were fed a basal diet containing all the known dietary factors which had been associated with feather pigmenta-

tion in other species, except the *L. casei* factor. Injections of the synthetic *L. casei* factor to supply 10 μg. daily produced good feathering and pigmentation comparable to that of chicks receiving 10% brewers' yeast. Lower levels of *L. casei* factor were less effective, poor feathering and depigmentation occurred.—E. KODICEK.

IYER, S. G., & MUKHERJEE, R. (1947.) **The danger of vitamin deficiency in poultry.**—*Indian Fmg.* **8.** 70–71. **1470**

An account of outbreaks of avitaminosis-A in young (8–14 week) chicks during May-June, 1945 and 1946 on poultry farms in N. India. Ocular changes were predominant, and the livers were low in vitamin A. The outbreaks subsided within a week of providing plenty of green plant food and cod liver oil.—F. C. MINETT.

ENSMINGER, M. E., BOWLAND, J. P., & CUNHA, T. J. (1947.) **Observations on the thiamine, riboflavin, and choline needs of sows for reproduction.**—*J. Anim. Sci.* **6.** 408–423. **1471**

Based on an experiment with breeding sows fed a purified diet containing casein, lard, sucrose and mineral salts, thought to be adequate in all other respects, groups of two sows were fed with thiamine, riboflavin and choline omitted. Observations on 18 sows used over two years were made.

Symptoms of vitamin B complex deficiency developed including loss of appetite, premature parturition, and weak and oedematous piglets. Records of reproductive histories are provided, as are the results of tissue analyses of those treated pigs, which were slaughtered, and also of those piglets that died.—G. L. BAILEY.

HERTZ, R. (1946.) **Biotin and the avidin-biotin complex.**—*Physiol. Rev.* **26.** 479–494. **1472**

H. reviews the literature regarding the avidin-biotin complex. The methods of assay consist of microbiological tests using *Saccharomyces cerevisiae*, *Lactobacillus arabinosus*, *L. casei*, *Clostridium butylicum* and *Rhizobium trifolii*. In a wide variety of natural materials biotin was found in varying degree in almost all substances tested. The highest content was detected in liver and yeast. It was also found in several crystalline enzymes and viruses. A biotin deficiency obtained by feeding egg-white was caused by avidin, a protein which forms an unabsorbable complex with biotin. Avidin was found also in certain specialized tissues of the genital tract in species known to require biotin. The immediate applicability of the knowledge of biotin and avidin offers great difficulties. The role of these substances in cancer, cellular metabolism in general and resistance to disease is being investigated.

—E. KODICEK.

POWICK, W. C., ELLIS, N. R., & DALE, C. N. (1947.) **Relationship of corn diets to nicotinic acid deficiency in growing pigs.**—*J. Anim. Sci.* **6.** 395–400. **1473**

Three experiments to study the nicotinic acid requirements of pigs are described. A diet containing 84% yellow maize 15% tankage with ground limestone and common salt and cod liver oil, supplied 0·7 mg. of nicotinic acid per kg. live weight and there were no symptoms of deficiency.

In the second experiment different diets were used and the nicotinic acid intake was adjusted to supply 5·82 mg., 0·82 mg. and 0·64 mg. per kg. of live weight; no deficiency symptoms developed.

A purified diet was used in the third experiment containing purified casein, dextrin, salt mixture agar, lard, which produced symptoms of nicotinic acid deficiency. Additions of various percentages of yellow maize were made; an addition of 40% appeared to accentuate the deficiency symptoms but addition of a further 30% ameliorated them. It is suggested that the aggravation of symptoms occurs only in the absence of adequate nicotinic acid and is not merely due to an anti-nicotinic acid effect.

—G. L. BAILEY.

TAYLOR, L. W. (1947.) **The effect of folic acid on egg production and hatchability.**—*Poult. Sci.* **26.** 372–376. **1474**

One hundred and sixteen single comb White Leghorn hens were used to ascertain the effect of folic acid on egg production and hatchability. The basal diet consisted of sardine meal, polished rice, sardine oil (400D–3,000A), bone meal, ground oyster shells, casein, salts, calcium phytate, B-vitamins, vitamin E and 2-methyl-1 : 4-naphthohydroquinone diacetate. Supplementation with folic acid did not result in a significantly increased egg production. The basal ration alone produced progressively poorer shell quality as the season advanced. The microbiological assay for folic acid of the basal ration revealed that the requirement of folic acid for egg production was low, not in excess of 12 μg. per 100 g. of diet. The hatchability of supplemented hen's eggs was superior (65–82%) to that of control hens (31·5–77·8%). There was a definite seasonal variation in hatchability not related to the folic acid content of the diet.—E. KODICEK.

MASON, K. E., & TELFORD, I. R. (1947.) **Some manifestations of vitamin E deficiency in the monkey.**—*Arch. Path.* **43.** 363–373. [Authors' summary copied *verbatim*.] **1475**

Four young monkeys that had been reared for two to two and one-half years on a vitamin E-deficient diet showed extensive accumulations of an acid-fast pigment in smooth muscle cells of

the blood vessels, stomach, intestines, gallbladder, bronchi, urinary bladder and fallopian tube, in the reticuloendothelial cells of lymph nodes and spleen and in many connective tissue macrophages. There was gross and histologic evidence of dystrophic changes in skeletal muscles, with deposition of small amounts of pigment in the fibers. Cardiac muscle fibers contained some pigment but showed little or no evidence of damage. On the basis of similar findings in other laboratory animals, these observations are presented as evidence that a state of vitamin E deficiency can be induced in the monkey.

HERSCHEL, A. (1946.) Hypothetische beschouwing over het verband tusschen de α tocopherol– en de cystine–isoleucine stofwisseling. [**Hypothesis as to the relation between the metabolism of α-tocopherol and of cystine, isoleucine.**]—*Tijdschr. Diergeneesk.* **71.** 699–707. **1476**

H. reviews the literature on the effects of vitamin E on the condition of the coat, growth, lactation and neuromuscular affections in albino rats and records his own findings.

He found that the addition of cystine and isoleucine at the rate of 60 mg. of each per animal per day to a vitamin E-free diet restored normal coats within three days in discoloured albino rats. Isoleucine was found present in linseed meal. The different results obtained by different investigators using different vitamin E-free diets were attributed to the fact that the amino-acids (cystine and isoleucine) were altered by the processes utilized to render the diets vitamin E-free.

It is noted that the growth disturbances, recorded by some, in rats on a vitamin E-free diet were not observed by others. Glaxo-casein contains no isoleucine and in the casein extracted by the method of Coward the cystine also is removed. H. and his co-workers believe that the fat-soluble growth vitamin of Evans and Burr, Coward-Key and Morgan [see also *V. B.* **13.** 64] and others is only the amino-acids (cystine and isoleucine).

Vitamin E is not a lactation factor because rats on a vitamin E-free diet + 15% glaxo-casein + 0·2 ml. wheat germ oil per animal per day could not feed their young, while the substitution of light white casein for glaxo-casein enabled females to feed their young.

A deficient milk secretion in women was improved by the administration of isoleucine and cystine.

Paralysis in rats kept on a vitamin E-free diet was not observed in all cases. The failure of development of paralysis is attributed to the fact that the animals had not been kept under observation long enough. He also suspects that the methods employed to render the diet vitamin E-free may account for some of the results obtained. In neuro-muscular affections tocopherol is definitely an important factor. Some of the literature dealing with vitamin E and neuromuscular affections in man is reviewed. H. discusses the chemical composition of isoleucine and cystine and refers to the various metabolic processes and disease conditions in which they and tocopherol may be concerned. It is suggested that the oxidation of fats which renders a diet vitamin E-free may likewise destroy the amino-acids. The vitamin L of Nakahara and others is considered to resemble the "intrinsic factor" of Castle. The decreased proteolysis in cases of E-avitaminosis in rats, in habitual abortion in women and in pernicious anaemia is theoretically attributed to vitamin E and amino-acids deficiencies. It is suspected that isoleucine may also be involved in the exudative diathesis in chickens and that tocopherol may be the unidentified substance considered essential in certain reactions in which cystine is involved and in which heavy metals act as catalysts. It is suggested that tocopherol may constitute part of the oxidation and reduction chains or may be linked with a protein of which cystine and isoleucine constitute active parts.

—P. L. LE ROUX.

ANON. (1947.) **A lactation vitamin.**—*Brit. med. J.* August 2nd. 181. **1477**

A substance from the oil of the fenugreek herb (*Trigonella* spp.) has been isolated, which in doses of 0·125 mg. administered *per os* promoted lactation in 345 out of 350 cases. The volume of milk increased two- to nine-fold depending on the stage of lactation, the most marked effect being in the earlier stages; the content of fat, vitamins A, B_1, B_2 and C increased. The active principle derived from fenugreek oil has been named "H" factor. The pure substance is fat soluble, exists in needle-like crystals with a melting point of 137°C. and has a characteristic absorption band. It is thermostable, not readily oxidized and contains a single hydroxyl group. The "H" factor is not identical with the tocopherols.—E. K.

TEICHMANN, R., & ALLENDORF, B. (1943.) Abortus Bang und Fütterung. [**Contagious abortion and nutrition.**]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Sept. 17th. 311–315. **1478**

The authors suggest that the course of contagious abortion is dependent on the state of nutrition of the animals and that further controlled experiments will be needed to study this problem.

—E. KODICEK.

BEESON, W. M., ANDREWS, F. N., & BROWN, P. T. (1947.) **The effect of thiouracil on the growth and fattening of yearling steers.**—*J. Anim. Sci.* **6.** 16–23. **1479**

Five lots of ten Hereford steers weighing an average of 790 lb. and selected for uniformity were fed for a period of 154 days on a basal diet which consisted of maize and maize meal 13·57 lb., soya bean oil meal 2·23 lb., maize silage 12·93 lb., mixed clover, timothy hay, salt and bone meal. After 56 days of the feeding, doses of 2 g., 4 g., and 6 g. thiouracil were incorporated with the soya bean oil meal. Thiouracil was refused when it was mixed with salt only.

The animals were weighed on three consecutive days at 28-day intervals. All groups consumed equal quantities of food, and they all made good gains in live weight.

Thyroid weights were increased by the use of the drug, but there is some evidence that continued administration of a large dose may lead eventually to a reduction in weight. No significant changes in the rate of gain, dressing percentage and carcass quality between control and treated animals occurred.—G. L. Bailey.

Andrews, F. N., Beeson, W. M., Barrick, E. R., & Harper, C. (1947.) **The influence of thiouracil and thiourea on the growth and fattening of lambs.**—*J. Anim. Sci.* **6.** 3–11. **1480**

Eight lots of 20 Rambouillet lambs were used in an experiment on the feeding of thiouracil and thiourea over a period of 84 days. The lambs were fed a basal ration of yellow maize, maize silage, red-clover hay and salt with concentrates in pellet form, made up of soya bean meal, alfalfa meal, and 2% salt. The drugs were incorporated with the concentrates so that 0·4 lb. would contain doses of 0·25 g., 0·5 g., 1·0 g., 2·0 g. of thiouracil and 0·25 g., 0·5 g., 1·0 g. of thiourea. In practice it was found impossible to maintain a consumption of 0·4 lb. concentrates per day.

The results are given of the gains in weight per lb. of food. 1·148 g. thiouracil and 0·048 g. thiourea produced significant reductions in the rate of gain, and as the dose levels of the drugs increased so the tendency for the food required per lb. gain also increased. This may be explained in part by the lowered protein intake resulting from refusals to eat the pellets.

The effects of the treatment on the thyroid weight, carcass yield and carcass grade are summarized, both drugs increased the thyroid weight to a marked extent. Carcass dressing percentages were unaffected. High doses of the drugs reduced the carcass weight greatly, but there was some evidence of improved quality with doses of 0·18 g. and 0·33 g. thiouracil.

A review of earlier work with the two drugs is included.—G. L. Bailey.

Van Der Noot, G. W., Reece, R. P., & Skelley, W. C. (1947.) **The effect of thiouracil in the ration of growing swine.**—*J. Anim. Sci.* **6.** 12–15. **1481**

Four groups of four pigs were used to determine the optimum dosage of thiouracil for economic gains in weight; the control group consumed 820 lb. of food to gain 100 lb. live weight and the treated groups, receiving dosages of 0·15%, 0·20% and 0·25% thiouracil, all gained the same weight on less food. The minimum food intake per 100 lb. live weight gain was 615 lb., and this was consumed by the group receiving the greatest dose. In another experiment the average daily gain of pigs receiving 0·25% thiouracil was greater than that of control pigs which received no thiouracil. In both experiments all the animals were fed to appetite.

—G. L. Bailey.

Glazener, E. W., & Jull, M. A. (1946.) **Effect of thiouracil on naturally occurring molt in the hen.**—*Poult. Sci.* **25.** 533–535. **1482**

Two groups of 14 fowls each were used, one group being dosed individually every day over a 26-week period with a gelatin capsule containing 0·450 g. of thiouracil. The experiment was commenced in August. The body weight and egg production of the two groups remained approximately the same but the onset and completion of the moult in the group fed with thiouracil were retarded. 0·450 g. per day seemed to be near the optimum level for the fowls used and higher than 0·6 g. per day soon produced toxic effects.

—J. W. Blaxland.

See also abst. **1548** (herbage and fodder plants).

DISEASES, GENERAL

Magnusson, H. (1945.) Om grässjuka hos häst. [**Grass sickness.**]—*Svensk. Militärvet. Kvartalsskr.* **3–4.** Reprint. pp. 17. **1483**

This is a general discussion on grass sickness, written for instructional purposes in connexion with its recognition in Sweden. As long as 25 years ago it was very likely in existence there, unrecognized as such, because old case protocols now examined record the typical P.M. findings. The disease has become quite common in army remounts kept on particular permanent pastures in Scania and ten fatal cases occurred in 1945. It is probable that grass sickness also occurs in Denmark.

The possible causes are discussed, but the true cause remains obscure both in Scandinavia and Great Britain.—J. E.

Doyle, L. P., Cable, R. M., & Moses, H. E.

(1947.) **A destructive turkey disease.**—*J. Amer. vet. med. Ass.* **111.** 57–60. **1484**

Approximately 20,000 young turkeys died in 1944 and 12,000 in 1945; mortality was rarely less than 50%, and losses were limited to poults under ten weeks of age. None of the farms affected in 1944 escaped in 1945 but there were no outbreaks in 1946.

The disease was sudden in onset and spread rapidly; as many as 1975 out of 2,000 birds died within three weeks on one farm. Affected poults were listless and weak and a mucous-coated diarrhoea was common; loss of condition was sometimes marked. There were no prominent P.M. lesions; a few petechial haemorrhages were noticed in the intestinal mucosa of some birds but a mucoid enteritis was common in the small intestine. Bacteriological examinations were negative; microscopical examinations of intestinal scrapings showed numerous flagellates, notably *Trichomonas gallinarum* and *Hexamita meleagridis*. Subsequent experimental work showed that these parasites were not associated with laboratory cases of the disease.

See also abst. **1554** (text-book).

The authors conclude that the disease observed was due to some unknown aetiologic agent. A few observations on the use of sulphonamide drugs against *H. meleagridis* are also reported. Sulphaguanidine was thought to be beneficial in the field in outbreaks of the disease.

—J. D. Blaxland.

van Ness, G. (1947.) **The production of so-called "pullet disease".**—*Poult. Sci.* **26.** 304–305. **1485**

Experiments involving the feeding of 1%, 2% and 4% KCl, 4% NaCl and 4% $CaCO_3$ to twelve laying pullets are described. Pathological changes took place with 2% and 4% KCl which the author describes as the potassium effect; some of these changes were similar to those occurring in pullet disease. 4% NaCl did not cause the same changes and 4% $CaCO_3$ together with 4% KCl appeared to prevent them to some extent. The author considers that the role of sodium and calcium should be investigated as a possible treatment in outbreaks of pullet disease.

—J. D. B.

POISONS AND POISONING

Silva Leitão, J. L. (1945.) Administração de tetracloreto de carbono a ovinos. [**The toxicity of carbon tetrachloride in sheep.**] —*Repos. Lab. Pat. vet., Lisboa.* **6.** 153–157. [English, French and German summaries.] **1486**

From experiments on lambs not more than six months old, the author concluded that the toxic dose of carbon tetrachloride is much greater than has been supposed. One lamb, for example, survived a dose of 55 ml. of the drug when medication was followed by the injection of calcium gluconate. Other lambs survived doses of 15 and 20 ml. of carbon tetrachloride, without subsequent calcium therapy.—I. W. Jennings.

PHARMACOLOGY AND THERAPEUTICS

Loewe, L., & Alture-Werber, E. (1947.) **Streptomycin dosage schedules for clinical use.** —*Bull. N.Y. Acad. Med.* **23.** 589–595. [Authors' conclusions copied *verbatim.*] **1487**

The intramuscular administration of streptomycin is the method of choice. Streptomycin is retained in the blood in effective therapeutic concentration for relatively long periods of time thereby permitting a more convenient spacing of the intramuscular injections. Studies are in progress with retarding menstruums to level off the peaks and achieve still more prolonged effects.

Mushett, C. W., & Martland, H. S. (1946.) **Pathologic changes resulting from the administration of streptomycin.**—*Arch. Path.* **42.** 619–629. [Authors' summary copied *verbatim.*] **1488**

The parenteral administration of highly purified as well as average streptomycin samples resulted in fatty metamorphosis of the liver in monkeys and dogs. Large doses of streptomycin concentrates produced small foci of necrosis in the livers of a few dogs.

Fatty metamorphosis was observed less often in the kidneys of monkeys and dogs treated with streptomycin. Albuminous detritus appeared in the subcapsular spaces and the tubules of the kidney in some of the monkeys. Hyaline and granular casts, epithelial cells and occasionally blood cells were seen in the sediment of the centrifuged urine of dogs receiving large doses of streptomycin concentrates. Focal tubular necrosis occurred in the kidneys of one dog.

The fatty change observed in the liver and the kidney was found to be reversible. It was not followed by permanent pathologic damage.

Complete studies of the blood of monkeys, dogs and rats treated by injection of streptomycin revealed as the only significant change slight normocytic anemia, which disappeared on cessation of dosage.

Prolonged administration of streptomycin concentrates of average purity (230 to 310 micrograms of streptomycin base per milligram of solids) resulted in neurotoxic effects in dogs, manifested by disturbances of equilibrium and possibly of auditory acuity. Spontaneous recovery occurred in 1 animal. No lesions which could explain these effects were evident in the limited material studied. Streptomycin samples of higher potency (640 to 710 micrograms of streptomycin base per milligram of solids) did not produce neurotoxic symptoms in dogs.

RUBE, E. (1942.) Versuche mit Globucid und Albucid bei bakteriellen Erkrankungen des Rindes. **[Experiments with globucid and albucid in bacterial diseases of cattle.]**—*Inaug. Diss., Hanover.* [Abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 96. (1943). **1489**

Globucid (sulphanilamido-ethyl-thiodiazole) may be given in three or four successive daily doses of 0·12 g. per kg. without causing toxic effects, and albucid (sulphacetamide) in daily doses of 0·09 g. per kg. without harm.

Both drugs gave good results in acute mastitis, but were incapable of securing bacteriological cures. For puerperal infections (metritis), both drugs gave useful support to local treatment with sulphanilamide or marfanil (4-aminomethylbenzene sulphonamide) powder.—J. E.

MCAULIFF, J. L. (1947.) **Clinical use of sulfamerazine in the treatment of haemorrhagic septicemia and pneumonia in cattle.**—*J. Amer. vet. med. Ass.* **110.** 314–318. **1490**

The author reports clinical observations on the use of sulphamerazine in the treatment of 122 cases of haemorrhagic septicaemia and pneumonia in cattle and 27 cases amongst calves. Owing to the relatively slow absorption and excretion of the drug it was used at the rate of 0·5–1·5 grains per lb. body weight, either alone or in conjunction with haemorrhagic septicaemia antiserum, although the latter had apparently no significant effect on the rate of recovery. 95% of the cattle and 93% of the calves recovered after treatment. Adequate dosage is essential, and the author recommends an initial daily dose of 1·5 grains per lb. in equal parts at eight-hour intervals, followed by 0·5 grains per lb. for the next two or three days in two equal daily doses; or 0·33 grains per lb. of the sodium salt of sulphamerazine, intravenously injected in a 6% solution, followed by oral doses of sulphamerazine for a few days. No toxic or untoward effects resulted from treatment. The advantage of this particular sulphonamide derivative, used as described, is the prompt clinical response with less frequent dosage than in the case of many other drugs of this series.—A. EDEN.

MCNEIL, E., & HINSHAW, W. R. (1946.) **Field trials on the use of sulfamerazine for a respiratory disease of turkeys.**—*Poult. Sci.* **25.** 273–277. **1491**

Turkeys affected with infectious sinusitis and varying in age from five weeks to five and a half months, responded to treatment with sulphamerazine alone or in combination with sulphathalidine when these drugs were fed to them in dry mash. Treatment was commenced in the early stages of the disease. The drugs were fed at levels of 0·25%–0·5% in the mash for from five to seven days. Food consumption remained normal for a longer period when the level was 0·25% and the sulphonamide blood level was higher at the seventh day with a 0·25% concentration in the food than on the fifth day with a 0·5% concentration. Symptoms of the disease reappeared after treatment was discontinued.—J. D. BLAXLAND.

PORTER, J. J., & KELMAN, A. C. (1947.) **Effect of volume of distilled water as vehicle for penicillin in treating chronic streptococcic mastitis.**—*J. Amer. vet. med. Ass.* **110.** 246–248. **1492**

The efficacy of the treatment (applied to 300 quarters) was about the same with the dose of penicillin (50,000 units) in 10 ml., 100 ml. or 500 ml. of sterile distilled water. Ten ml. is suggested as a standard diluent.—J. M. ROBSON.

JENSEN, K. A., & JEPSEN, A. (1945.) **Treatment of cattle for chronic streptococcus mastitis with crude penicillin.**—*Skand. VetTidskr.* **35.** 552–574. [In English.] **1493**

Investigations have shown filtered non-purified culture medium from full-grown *Penicillium* cultures to be active in the treatment of chronic streptococcal mastitis in cattle. The amount of active substance in the substrate varied from 5,000 to 10,000 Oxford units per l. After infusions of 2 × 750–1,250 ml., at 1–3 days' interval, between 80 and 90% of the treated quarters were found to be free from bacteria at the first re-examination, 1–2 months after the first treatment. The investigation covered 340 treated quarters which were subjected to regular bacteriological examination for 15 months. Relapses and re-infection occurred in 20–25% of cases. The treatment caused a transitory general reaction with fever. The local reaction in the udder was generally benign and of brief duration. —E. V. L.

BROWNLEE, G., & BUSHBY, S. R. M. (1948.) **Chemotherapy and pharmacology of aerosporin. A selective gram-negative antibiotic.**—*Lancet.*

254. 127–132. [Authors' summary copied *verbatim*.] **1494**

Aerosporin is a basic peptide produced by *B. aerosporus* (or *polymyxa*). A hydrochloride approaching chemical purity (aerosporin standard 1947), containing 10,000 " units " per mg., serves as the standard of reference.

Compared with streptomycin in the test-tube, aerosporin is more discriminating in its activity, which is restricted to several gram-negative pathogens, against which it is from ten to many hundred times more active than is streptomycin. It has no action against the tubercle bacillus.

In experimental infections in animals aerosporin gave complete protection against *H. pertussis* with elimination of the infection whereas streptomycin did not protect. Similar effects were demonstrated in experimental infections with *S. typhi*, *H. bronchisepticus*, and *Bact. coli*.

Aerosporin is not absorbed from the gut, from which it eliminates sensitive organisms. Given parenterally it disappears from the bloodstream quickly; hence four-hourly maintenance doses are necessary. In the normal animal it is not detected in cerebrospinal fluid, bile, or urine in a biologically active form. After a single intrathecal dose in the rabbit therapeutic concentrations persist for twenty-four hours.

Aerosporin is bactericidal. The time taken to kill depends on the number of organisms and the concentration of aerosporin present. Resistant strains are produced with difficulty.

Aerosporin is more acutely toxic than streptomycin; but in terms of intrinsic antibacterial efficiency their therapeutic indices are of the same order. The blood-aerosporin level corresponding to the minimal lethal intravenous dose (L.D.50) is at least 75 times greater than the average therapeutic blood-level. Aerosporin is non-haemolytic and has about the same toxicity to leucocytes as penicillin.

Aerosporin concentrates are more or less contaminated with an antidiuretic principle and a substance which damages the renal tubules. Purified material is free from the second factor, and the first has not been shown to act in man.

STÄLLBERG-STENHAGEN, S., & STENHAGEN, E. (1945.) **A monolayer and X-ray study of mycolic acid from the human tubercle bacillus.** —*J. biol. Chem.* **159.** 255–262. **1495**

The properties were studied of monolayers formed upon aqueous solutions of acids, alkalis and various ions, by mycolic acid from human type tubercle bacilli, at varying temperatures. The monolayers resembled the liquid-expanded type, had a temperature of half expansion of 41°C. and were unstable when the area per molecule was reduced below 60 sq. Å. X-ray diffraction patterns of specimens precipitated from solvents indicated that the length of the molecule was 50 or 100 Å depending on whether single or double molecules were concerned in the arrangement. —R. MARSHALL.

JENSEN, K. A., FREDERIKSEN, E., & KLAER, I. (1944.) **Experimental studies on chemotherapy in tuberculosis. II.**—*Acta path. microbiol. scand.* Suppl. No. 54. pp. 277–304. [In English. For previous part, see *V. B.* **15.** 318.] **1496**

The authors examined four substances, *viz.*, sulphanilamide, promin (sodium *p*, *p'*-diaminodiphenyl sulphone-N-N'-didextrose sulphonate), tibatin (galactoside 4, 4'-diaminodiphenyl sulphone) and diaminodiphenylsulphone in g. pig infection experiments, having seen previously that an *in vitro* test did not appear to be conclusive for the action of these and similar substances in the animal body. They obtained indications that diaminodiphenylsulphone had the strongest inhibitory effect on the multiplication of the tubercle bacilli as well as on the development of the tuberculous processes. The effect of promin is due to a liberation of diaminodiphenylsulphone. Great caution is advocated in the use of promin which may have a neurotoxic effect unless prepared with particular care.—E. K.-N.

LAUNOY, L., & DAUZIER, M. (1944.) Traitement chimique des trypanosomides expérimentales et résistance à une infection ultérieure. (Note préliminaire.) [**Chemotherapy of experimental trypanosomiasis and resistance to subsequent infection.**]—*Bull. Soc. Path. exot.* **37.** 222–229. **1497**

In experiments on rats and mice infected with graded doses of *T. brucei* or *T. annamense* [= *T. evansi*] and cured by treatment with sulpharsphenamine, it was found that an immunity to subsequent infection with the same trypanosome was produced, and persisted longer than could be accounted for by a persistence of the drug. The duration of the immunity was dependent to some extent on the number of trypanosomes in the blood at the time of treatment, and whilst it might be effective against the re-inoculation of a small number of organisms, a large dose might overcome it.—U. F. RICHARDSON.

LWOFF, M., BOVET, D., & FUNKE, A. (1944.) Activité *in vitro* sur les trypanosomides de quelques dérivés de l'éthylène diamine. [*In vitro* **activity of some derivatives of ethylene diamine on trypanosomes.**]—*Bull. Soc. Path. exot.* **37.** 229–238. **1498**

On testing the activity of derivatives of ethylene diamine, some naphthalene derivatives, and a compound containing arsenious acid and

an ethylene diamine group, on cultures of *Strigomonas oncopelti*, *Leishmania tropica*, *L. donovani* and *Trypanosoma cruzi*, it was found that the ethylene diamine and naphthalene derivatives had an action *in vitro* comparable to that *in vivo*, indicating that their activity did not depend on any modification of their composition in the body. The arsenical compound, on the other hand, whilst active *in vivo*, did not prove trypanocidal *in vitro*.—U. F. RICHARDSON.

I. RANDALL, J. B., & LAWS, S. G. (1947.) **The effect of the stage of infection on the response of T. congolense in cattle to phenanthridinium 1553.**—*Vet. Rec.* **59.** 221–223. **1499**

II. RANDALL, J. B., & BEVERIDGE, C. G. L. (1947.) **A further note on the toxicity of phenanthridinium 1553 for cattle.**—*Ibid.* **59.** 224–226. **1500**

I. It is pointed out that in Uganda large-scale outbreaks of bovine trypanosomiasis occur in tsetse-free areas, and have been ascribed to the mechanical transmission of *T. congolense* by *Stomoxys*. Since negative blood examinations are not conclusive evidence that an animal is free from trypanosomiasis, to free a herd from infection it appears essential that all animals in the herd be treated. Evidence is produced that treatment with phenanthridinium 1553 is unlikely to result in complete elimination of trypanosomiasis owing to the high relapse rate following administration in the early stages of the disease. Using doses varying from 0·8 mg. per kg. to 1·5 mg. per kg. in single injections, and from 0·2 mg. per kg. repeated four times at weekly intervals to 0·8 mg. per kg. repeated after 14 days, the majority of cattle infected less than 15 days relapsed, but only one animal relapsed in those infected 24 days or more. This seems to indicate that immunity reactions play an essential part in assisting the action of the drug.

Failures of response to both phenanthridinium 1553 and 897 are recorded following attempts to develop drug fastness by treating relapses with subcurative doses of 1553, the trypanosome strains retaining this fastness after inoculation into other cattle. Subsequent treatment of these infections with stibophen resulted in immediate response in all cases.

II. Details are published of experimental work on the toxicity of phenanthridinium 1553 to cattle in Uganda, at accurately computed doses under laboratory conditions. Of eight animals infected with *T. congolense* treated by subcutaneous or intramuscular injection of doses varying between 2–5 mg. per kg., six developed photosensitization and the other two died before the condition had time to develop. Of three healthy animals treated with doses varying from 3–5 mg. per kg., the only animal to recover was that given three mg. per kg.

This work confirms the results of field trials that the drug is unsafe at a dose of 2 mg. per kg. in Uganda cattle. The dose now used is 5 ml. of a 1% solution per 100 lb., or 1·1 mg. per kg.
—U. F. RICHARDSON.

CRAWSHAW, H. A. (1947.) **The prophylactic use of phenanthridinium 1553 against infection with *T. congolense* and *T. vivax*.**—*J. comp. Path.* **57.** 13–19. **1501**

Observations were made in the Bechuanaland Protectorate to ascertain the extent and duration of the protective action of phenanthridinium 1553 against strains of trypanosomes occurring in the territory. In the first experiment cattle received an injection of the drug at the rate of 2 mg. per kg. body weight, and were then exposed to the risk of infection in a fly belt for nine days, after which blood smears were taken daily over a period of five months. Control animals soon showed signs of positive infection, firstly with *T. vivax* and later with *T. congolense*, but no parasites appeared in the blood of treated animals. The controls were then treated with the drug and the blood smears became negative after 24 hours. Repetition of the experiment gave a similar result.

Comparison was made of the intravenous and subcutaneous routes of administering the drug, and it was found that the protection afforded against infection with both *T. congolense* and *T. vivax* was independent of the route of administration; to avoid undesirable sequelae consequent upon subcutaneous injection, the intravenous method is to be preferred.

A single injection of phenanthridinium 1553 at the rate of 2 mg. per kg. will protect against natural infection for at least 14 days, although with repeated injections there is a cumulative toxic effect of the drug. C. emphasizes the need for large-scale experiments to test the prophylactic action of phenanthridinium 1553 at lower levels and at other intervals against infection with various strains of trypanosomes.—A. EDEN.

OESTERLIN, M. (1941.) Beitrag zum Problem der Arzneifestigkeit der Trypanosomen. **[The problem of drug-fastness of trypanosomes.]**—*Zbl. Bakt. I.* (Orig.) **147.** 335–338. **1502**

The mechanism concerned in the production of drug fastness is discussed. It is pointed out that chemotherapeutically active substances of the series of arsonic acids, arsenobenzol, acridine and styrylquinoline, though they vary in the rapidity with which drug fastness can be induced, belong to one group, and can be inhibited by the same interfering substances. The same point of attack in the cell must be assumed, and the essential

mechanism is a lowering of the permeability of the cell which is produced temporarily by interfering substances, and permanently by treatment with the chemotherapeutically active drug. Experiments with potassium hexatantalate, which inhibits phagocytosis, showed that this substance could be used to overcome drug fastness against salvarsan and arsenophenylglycine, but not that against atoxyl or acriflavine. It appears that it influences drugs which require the co-operation of the defence mechanism of the host animal, but not those which act directly on the parasite.

It is argued that the protection mechanism shows itself as an alteration in permeability resulting from the stimulation of the attack point of the cell, and that the drug fast cell is a specifically sensitized cell, and that this sensitization, and therefore drug fastness, can be reduced by exposure to potassium hexatantalate.—U. F. R.

GILBERT & AVELANGE. (1947.) La diamidine dans le traitement de la piroplasmose du cheval. **[Diamidine in the treatment of equine piroplasmosis.]**—*Rec. Med. vét.* **123.** 226–229. **1503**

Satisfactory results are claimed for the treatment of equine piroplasmosis in the Haute-Marne with the dichlorhydrate, or dimethane sulphonate, salts of diamidino-diphenoxypentane, given intravenously in doses of 1 g. dissolved in 20 ml. of hot water. Too rapid injection may provoke shock, as may also too hot a solution, but such shocks are rare, and do not cause abortion. It is claimed that this treatment is better than acriflavine or acaprin in that abortion and phlebitis are avoided, that one dose is usually curative, and that cured animals are not subject to the relapses and re-infections which occur after the use of the other remedies. It is suggested that treated animals have a sterile immunity, but longer experience is required in regard to the duration of this immunity. [No information is given as to the species of piroplasm involved.]—U. F. R.

BUER, A. W. (1947.) Undersøkelse over hvalpesykevaksinasjon med virus-serum fra Burroughs Wellcome and Co., England. **[Trials of a proprietary dog distemper vaccine.]**—*Norsk VetTidsskr.* **59.** 48–54. [English summary, slightly amended.] **1504**

One hundred and fifty eight dogs were vaccinated against distemper with virus-serum. Immediately after vaccination 26 of the dogs, *i.e.*, *ca* 17% became seriously ill, with the usual symptoms of distemper. One of these died of pneumonia and another with convulsions. Also a third dog died, but this animal had fallen into a lake and subsequently got pneumonia.

Seven or eight months after the vaccination inquiries were made respecting the dogs. There was reported only one very doubtful case of distemper after 6 months. As most of the dogs belonged to Oslo and the vicinity, where distemper was always very prevalent, it must be assumed that very good immunity was attained. On the other hand, the vaccine cannot be said to be satisfactory as regards the reaction following vaccination.

Afterwards the results of 186 vaccinations with a new supply of virus-serum were investigated. On this occasion only 6 of the dogs got ill immediately after vaccination. Three of these died and one had to be killed. As only 2 months had elapsed since the vaccination, nothing definite can be said as to the question of immunity. Two of the vaccinated dogs, however, contracted distemper.

LAGEREVA, M. G. (1944.) O sposobakh i sredstvakh lecheniya chesotki sel'skokhozyaistvennykh zhivotnykh. **[Methods and means of treatment of mange in farm animals.]**—*Veterinariya, Moscow.* No. 7. pp. 13–17. **1505**

The article reviews the recommendations of various Russian authors chiefly in relation to the treatment of mange in horses.

For horses it is recommended that two treatments be given in a gas chamber containing sulphur dioxide in a concentration of approx. 5·5% to be followed by brushing of the head and neck with an emulsion containing 4–6% of "soap K" three times at intervals of several days. Special attention must be given to badly affected areas such as the intermaxillary space and the ears. "Soap K" is said to kill the eggs of sarcoptic mites, but not of psoroptic mites.

Other preparations recommended are :– (a) 20% mixture of wood tar–crude potassium carbonate. (b) Wood ash mixed with creoline. (c) A mixture containing kerosene 74 parts, benzene 20, ether 4 and carbolic acid 2. (d) Diesel oil–48 parts, mixed with 1% caustic soda solution –48 parts, phenol–2, "K soap"–2. (e) Birch tar —1,000, kerosene–1,000, lysol–100, common salt –200.

To stimulate hair growth after mange, application of 40% aqueous hyposulphite solution is recommended followed by massage with cod liver oil. To improve the condition of the skin the use is suggested of an ointment (salicylic acid–10 parts, denatured spirits–30, vaseline–160) twice at intervals of three or four days.

Sheep have been successfully treated in natural warm sulphur springs, containing sulphuretted hydrogen, calcium salts and radio-active substances, by daily bathing for three days or, in bad cases, 4–5 days, this course of treatment being repeated as may be necessary.

A description is given of an apparatus to determine the sulphur dioxide concentration in

gas chambers by withdrawing known volumes of gas through an iodine solution.—S. W. SALTER.

LOEW, E. R., KAISER, M. E., & MOORE, V. (1946.) **Effect of various drugs on experimental asthma produced in guinea pigs by exposure to atomized histamine.**—*J. Pharmacol.* **86.** 1–6. **1506**

Experimental asthma induced by exposure to atomized histamine was not alleviated by trasentin (β-diethylaminoethyl-diphenyl acetate hydrochloride), pavatrine (β-diethylaminoethylfluorene-9-carboxylate hydrochloride), syntropan (γ-diethylamino-β-β-dimethyl propyl *d.l.* tropate phosphate, ergotamine tartrate, local anaesthetics (procaine and nupercaine) and respiratory depressants (morphine and pentobarbitone). Effective antispasmodic drugs in order of decreasing potency were adrenalin, benadryl, pethidine, atropine, papaverine and aminophylline. Physostigmine and ephedrine increased the severity of the experimental asthma.—J. M. ROBSON.

RAYMOND-HAMET. (1941.) Les ongules artiodactyles sont-ils doués d'un mécanisme vaso-dilatateur adrénalino-sensible ? [**Adrenalin-sensitive vaso-dilatation in ungulates.**]—*C. R. Soc. Biol. Paris.* **135.** 562–566. **1507**

The author attempted to prove that as in the domestic carnivores, adrenalin has a depressor action on blood pressure when its normal pressor action is suitably prevented as for example by the administration of ergotoxine.

As a result of experiments on a young goat he concludes that there may be an adrenalin sensitive vaso-dilator mechanism in the goat but if so it is very poorly developed in comparison with that of the dog and cat.—R. J. F.

GREGORY, R. A. (1947.) **A technique of general anaesthesia in ruminants.**—*Vet. Rec.* **59.** 377–378. **1508**

Cyclopropane is a potent anaesthetic gas, a concentration of about 35% in oxygen giving full surgical anaesthesia. It is comparatively free from toxic effects on the heart, lungs, kidney or liver.

The animal to be anaesthetized is restrained on its side while nembutal (1 g. per ml.) is injected into the jugular vein. The injection is made slowly and is stopped as soon as signs of anaesthesia appear. This temporary anaesthesia enables a laryngoscope to be introduced, and an intratracheal tube to be passed into the trachea. A cuff is then inflated so as to make an airtight joint with the trachea and the tube is connected to a soda-lime container and rebreathing bag. Oxygen and cyclopropane are run into the circuit in the proportion of approximately 6 : 1, and the bag is partially filled. As the effect of the nembutal wears off more cyclopropane is added. If too much cyclopropane is introduced and breathing ceases more oxygen is added and the bag gently compressed a few times. After the operation the cuff is deflated and the tube removed. Recovery is quiet and the animals are usually conscious and sitting up in about two hours.—J. O. L. KING.

SULKIN, S. E., & ZARAFONETIS, C. (1947.) **Influence of anesthesia on experimental neurotropic virus infections. II. In vitro studies with the viruses of western and eastern equine encephalomyelitis, St. Louis encephalitis, poliomyelitis (Lansing) and rabies.**—*J. exp. Med.* **85.** 559–569. [Authors' summary copied *verbatim.* For part I, see *V. B.* **17.** 389.] **1509**

Experimental neurotropic virus infections previously shown to be altered by ether anesthesia are caused by viruses destroyed *in vitro* by anesthetic ether ; this group includes the viruses of Eastern equine encephalomyelitis, Western equine encephalomyelitis, and St. Louis encephalitis. Experimental neurotropic virus infections which were not altered by ether anesthesia are caused by viruses which are refractory to the *in vitro* virucidal activity of even large amounts of anesthetic ether ; this group includes the viruses of poliomyelitis (Lansing) and rabies. Quantitative studies of the *in vitro* virucidal activity of ether indicate that concentrations of this anesthetic within the range found in central nervous system tissues of anesthetized animals possess no virucidal activity. The lowest concentration of ether possessing significant virucidal capacity is more than fifteen times the maximum concentration of the anesthetic tolerated by the experimental animal. Concentrations of ether 50 to 100 times the maximum amount tolerated by the anesthetized animal are capable of destroying large amounts of susceptible viruses, the average lethal dose (LD_{50}) being reduced more than 5 log units.

On the basis of the studies presented in this report, it cannot be concluded that direct virucidal activity of ether is not the underlying mechanism of the inhibition by anesthesia of certain experimental neurotropic virus infections. Indirect inhibition of the virus by the anesthetic through an alteration in the metabolism of either the host cell or the host animal as a whole appears at this point to be a more likely possibility.

I. PUCK, T. T. (1947.) **The mechanism of aerial disinfection by glycols and other chemical agents. I. Demonstration that the germicidal action occurs through the agency of the vapor phase.**—*J. exp. Med.* **85.** 729–739. [Author's summaries copied *verbatim.*] **1510**

II. PUCK, T. T. (1947.) **The mechanism of aerial disinfection by glycols and other chemical**

agents. II. An analysis of the factors governing the efficiency of chemical disinfection of the air. —*Ibid.* 741–757. **1511**

I. Theoretical analysis of the mechanism of action of chemical aerial disinfectants reveals that the rapid killing action which is obtained cannot be accounted for by a collision process between germicidal aerosol particles and the air-borne bacteria. However, a mechanism involving condensation of germicide molecules in the vapor state on to the bacteria-containing droplets results in a theoretical velocity of the correct order of magnitude.

Experimental tests of this theory show that pure germicide vapors free of aerosol droplets are almost instantly lethal to air-borne bacteria. Conversely, pure germicidal aerosols in the absence of vapor, had no effect on air-borne bacteria within 20 minutes or more. Therefore, it may be concluded on both theoretical and experimental grounds that rapid air sterilization requires the existence of the germicide in the vapor state.

II. The effectiveness of any compound as an aerial germicide depends upon the extent of condensation of its vapor on air-suspended bacteria, and on the rate at which the resulting concentration of germicide can produce death of the microorganisms. The properties of any compound conducive to production of the highest rate of kill of air-borne microorganisms by means of the smallest possible concentration of germicide vapor, are as follows: (a) a low vapor pressure, but not lower than 0·001 mm. Hg at 25°C.; (b) high hygroscopicity; (c) toxicity for bacterial metabolism—a high degree of potency is not necessary although the killing action will be more efficient the higher the antibacterial activity of the compound employed. For any compound the killing action is always a direct function of the concentration of its vapor in the air. The maximum amount of a hygroscopic substance which can exist in the vapor state decreases as the relative humidity increases. Hence, at high relative humidities the bacterial efficiency is lowest. At lower relative humidities the air can contain more vapor, and hence a greater effect is possible. At any relative humidity, the killing action is greater, the more closely the germicide vapor concentration approaches the saturation point.

The presence of soluble compounds in droplets containing bacteria promotes more extensive condensation of the germicide than would otherwise occur and so enhances its effectiveness. In the absence of such soluble substances, low atmospheric humidities may cause complete desiccation of a bacterial particle. Under these conditions its surface may become resistant to the condensation of the vapor, and thus prevent effective germicidal action. The influence of temperature changes on the killing efficiency may be correctly deduced from a consideration of the effect of a rise in temperature on the vapor pressure of the germicide and on the rate of its bactericidal action *in vitro*. Equations are presented for estimating quantitatively the magnitude of some of the effects discussed.

ROSEBURY, T., MEIKLEJOHN, G., KINGSLAND, L. C., & BOLDT, M. H. (1947.) **Disinfection of clouds of meningopneumonitis and psittacosis viruses with triethylene glycol vapor.**—*J. exp. Med.* **85.** 65–76. [Authors' summary copied *verbatim*.] **1512**

Triethylene glycol in excess of saturation, introduced as a vapor into a cloud chamber in which a dynamic cloud of either meningopneumonitis virus or psittacosis virus was developed simultaneously with, or in most instances subsequently to, the glycol cloud, induced distinct reduction in concentration of air-borne virus, as measured both by cloud sampling in capillary impingers and by exposure of mice to the cloud. The relative humidity in the chamber was held between 35 and about 60 per cent. Reduction of virus concentration in samplers, in glycol runs as compared with controls, ranged from 0 to 93 per cent (average, 62 per cent). Reduction of infective response in mice, based on counts of focal lesions on lung surfaces, ranged from 55 to 98 per cent (average 73 per cent).

HAUSAM, W., SCHNEGG, R., & SCHINDLER, T. (1944.) Untersuchungen zur Frage der Desinfektion milzbrandinfizierter Materialien, mit besonderer Hinsicht der Desinfektion tierischer Haut. **[The disinfection of anthrax-infected material, with special reference to hides.]**—*Zbl. Bakt. I.* (*Orig.*). **151.** 193–219. **1513**

The actions of thiocyanates and zephirol on anthrax spores were examined as probable hide disinfectants. Thiocyanates were tried in combination with other substances. The best results were obtained with a mixture of 1/16 Mol. sodium thiocyanate + N/8 HCL + 2·5% NaCl. The mixture kept well and rapid disinfection was obtained if the anthrax spores had been dried on garnets; the action was very weak on spores in hides. For the disinfection of hides a higher concentration of the thiocyanates than in the above mixture would be necessary, which would probably be detrimental to hides. Crude zephirol a watery solution of alkyldimethyl - benzyl - ammonium chloride is a good wetting agent. Used on spores dried on inorganic carriers like garnets its action was weak, but on the organic carriers on which it was tested–hazel nuts, silk threads, patches of

skin, hides, and a powder prepared from skin and rolled in fluid agar–it proved satisfactory. In testing for sterility by subculture in glucose broth enough of the disinfectant was probably carried over to cause inhibition of growth. Subculture tubes to which pieces of liver had been added allowed the growth of anthrax bacilli, probably by absorption of the disinfectant on to the liver, in cases where no growth was obtained in glucose broth. It could possibly be used as a skin disinfectant for tannery workers as it appears to be harmless for hides and also for the human skin.

—A. MAYR-HARTING

SHECHMEISTER, I. L, & GREENSPAN, F. S. (1947.) **The relation of the oil treatment of floors and bedding to the control of respiratory diseases among naval personnel.**—*Amer. J. Hyg.* **46.** 376–407. [Authors' summary amended.] **1514**

A study of the practical application of an oiling program, using germicidal oil-water-Roccal emulsion for control of respiratory disease, was described. By treatment of floors and blankets with this germicidal emulsion the number of organisms in the air was reduced 33 to 63 per cent and the total amount of dust in the oiled environment was sharply reduced, although it apparently did not change the *beta* type hemolytic streptococcus count per gram of dust. Isolated streptococci were mostly nonpathogenic, only 5 per cent being typed in group A. There was a slight but significant reduction in the *beta* type hemolytic streptococcus carrier rates in the group living in oiled environs. There was no apparent effect on the incidence of minor respiratory complaints. The treatment seemed to cause a slight reduction in the number of cases of respiratory disease during periods of low respiratory disease incidence, but had no effect during a period of high respiratory disease incidence.

See also absts. **1406** (streptomycin and TB.); **1442** (sulphydryl and pneumonia virus); **1453** (hexachlorethane for liver flukes); **1486** (carbon tetrachloride); **1529** (pregnancy serum).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

MERRITT, H. H., & BRENNER, C. (1947.) **Studies in new anticonvulsants.**—*Bull. N.Y. Acad. Med.* **23.** 292–301. [Authors' summary copied *verbatim.*] **1515**

Over 700 chemical compounds have been tested for anticonvulsant activity in animals. Approximately 10 per cent. of these demonstrated a high degree of anticonvulsant activity by these tests.

Only a few of these compounds have been given a clinical trial in patients with convulsive seizures. One of these, 5,5 diphenylhydantoin, has proved to be the most effective anticonvulsant yet discovered. None of the remaining compounds which has been given a clinical trial has proved superior to 5,5 diphenylhydantoin, with the possible exception of 5 methyl, 5 phenylhydantoin. This latter compound is not as yet suitable for general use on account of its toxic side effects.

Additional chemical compounds are being tested for their anticonvulsant activity in animals, and a clinical study of a larger number of those compounds which have an anticonvulsant activity in animals is in progress.

WINDER, C. V. (1947.) **Distribution of resting pain-reaction thresholds in guinea-pigs, with a statistical concept of gradation of biological effect.**—*Yale J. Biol. Med.* **19.** 289–310. [Author's summary copied *verbatim.*] **1516**

A statistical analysis was made of resting, threshold, radiant thermal stimulus energies (lamp wattage) required for eliciting the nociceptive contraction of the musculus cutaneous maximus, which previous work had placed in close integration with central pain mechanisms. The data consisted of three successive "readings" at 20-minute intervals on 365 animals, 133 by one operator and stimulator, and 232 by another operator and stimulator during a subsequent period. Due to a variable small drop between the first and second readings, the second and third were used in computing the resting threshold without significant loss in precision due to reduction in degrees of freedom.

Changes in thresholds in individual animals as measured by the difference between the first and the average of the second and third readings in watts were not normally distributed, but were (approximately ?) so after logarithmic transformation of the original readings in watts. This approximately "lognormal" distribution of threshold changes points the way to analysis of experimental designs based on threshold changes. It was inferentially related to the Weber-Fechner approximation through a presumed predominantly central origin of random fluctuations entailing corresponding approximately exponential fluctuations in peripheral liminal stimulus on a subliminal margin of receptor activation.

The distribution of thresholds *among* animals was approximately normal without transformation. This finding was inferentially related to the greater absolute variability among than within animals—to peripheral random factors superimposed upon and dominating central factors, such as a demonstrated erratic day-to-day influence of animal source, condition, and/or manner of depilation, etc.

Without significant influence on the thresholds were: elapse of as many as 74 days of observation, time of day, shade of (dark) skin color, body weight, and/or age within the range studied, and sex.

A statistical concept of gradation of so-called quantitative biological effects is proposed, based on successive levels of cumulative frequency distributions of preceding frequency distributions, biologically skewed and kurtotic in specific natural and experimental manners, and so fortuitously providing various degrees of success to such devices as the Weber-Fechner approximation.

FOSTER-CARTER, A. F., & HOYLE, C. (1945.) **The segments of the lung.**—*Dis. of Chest.* **11.** 511. [Abst. in *Amer. Rev. Tuberc.* **55.** No. 6. pp. 172–173 of absts. (1947.) Summary copied *verbatim.* Signed: K. R. BOUCOT.] **1517**

It seems expedient to define a bronchopulmonary segment as that portion of lung served by a principal branch of a lobar bronchus, and thus the branch may be called a segmental bronchus. Such branches are relatively constant. The anatomy of bronchi may be studied by casts, dissections and bronchograms. The surface limits of a segment may be studied by distending it with air through its bronchus. Collapse or inflation may be limited to a segment. Inter segmental boundaries are often marked by partial fissures on the surface of the normal lung. The radiological features of consolidation and collapse of each segment are described with a notation to the effect that, in nearly all so-called segmental consolidations, the radiographic shadow is smaller than would be expected from anatomical studies or inflation preparations. This is due to associated collapse. Proof of this lies in the presence of emphysema in adjoining segments, curving of interlobar fissures toward the shadow and compensatory displacement of the mediastinum or diaphragm. Conversely, there is nearly always some consolidation in a collapsed segment. There are nine major segments in the right lung and eight in the left lung. Levels of segmental boundaries are given with reference to a standard centering of the X-ray tube on the third costal cartilage at a distance of five feet. A segmental consolidation in the right middle lobe may be confused with interlobar effusion, but, in the lateral X-ray film, the fusiform homogeneous opacity of an effusion is absent. A bronchogram will usually distinguish between the two conditions by showing the relation of the middle lobe bronchus to the shadows. The most important application of segmental anatomy is the recognition of the fact that, where there is a segmental lesion, attention should be directed to the related bronchus where growth or stricture may be found. Thus, in bronchial carcinoma, an X-ray film revealing a large pulmonary opacity may be due not to growth but to consolidation or collapse due to growth in the affected bronchus. This will assist in estimating operability and in concentrating irradiation. In general, pneumonic lesions tend to transgress segmental boundaries or to affect less than a whole segment. This is especially true of atypical pneumonias. A truly segmental involvement is evidence against a simple pneumonic process. A knowledge of segmental anatomy with the direction of draining bronchi is important in planning postural drainage and in localization and external drainage of lung abscess. Acute putrid abscess is always segmental at its onset. Occasionally surgical resection of separate bronchopulmonary segments is possible.

GARCIA, G. M. (1946.) Proteidemia en los equinos. [**Proteinaemia in horses.**]—*Rev. Med. vet. Parasit., Caracas.* **5.** 81–96. **1518**

G. gives an account of equine serum proteins, including the antibodies, and lists those factors which cause quantitative variation thereof. He examined the blood of 100 horses, pure-bred, half-bred and of mixed breed. These were in normal health, apart from the fact that a certain number were harbouring various parasites. The following results expressed in g. % were obtained:– plasma protein, maximum 7·8, average 5·9, minimum 5·1; haemoglobin, maximum 15, average 11·3, minimum 10, and the haematocrit reading %, maximum 44, average 33·2, minimum 31.—I. W. JENNINGS.

LINDGREN, S., & WALLDÉN, L. (1944.) **Intrasternal administration of heparin.**—*Acta med. scand.* **117.** 417–423. [In English. Authors' summary copied *verbatim.*] **1519**

The intrasternal method of administering heparin produces the same effect on the coagulation time as intravenous injection.

JOSEPH, J. (1947.) **Absence of cell multiplication during degeneration of non-myelinated nerves.** *J. Anat.* **81.** 135–139. [Author's summary copied *verbatim.*] **1520**

The anterior mesenteric nerve of the rabbit, consisting almost wholly of non-myelinated nerve-fibres, was found to show $75{\cdot}56 \pm 18{\cdot}12$ nuclei per 10,000 μ^2 in transverse sections 5 μ thick. Twenty-one days after the fibres of this nerve had been interrupted by crushing or severance the nuclear population in the distal stump was $74{\cdot}95 \pm 18{\cdot}24$. Evidently the cell population has changed little, if at all, in contrast to the multiplication by more than eight times which occurs in the nuclei of myelinated nerve during degeneration. The differences between the two types of nerve are (*a*) the lack of myelin,

and (*b*) the smaller space within the neurilemma of the non-myelinated nerve. The cell multiplication in a myelinated nerve must therefore be due either to the effect of the break-down products of myelin or to the physical collapse of the large axons.

DEMPSEY, E. W., BUNTING, H., & WISLOCKI, G. B. (1947.) **Observations on the chemical cytology of the mammary gland.**—*Amer. J. Anat.* **81.** 309–341. [Authors' summary copied *verbatim.*] **1521**

Lipid droplets occur in the alveolar cells of mammary glands from rats, cats, guinea pigs and women. These droplets accumulate in the basal portions of the cells during pregnancy and are found apically during lactation. These droplets have been investigated using a battery of reactions for lipids. They do not exhibit reactions characteristic of ketosteroids. The yellowish fluorescence of these droplets in the rat suggests the presence there of carotene; in the cat, a quickly-fading greenish fluorescence suggests the presence of vitamin A.

See also abst. **1536** (endocrine system).

Intense basophilia, destroyed by ribonuclease and indicative of ribonucleoproteins, occurs in the alveolar cells during pregnancy and lactation. Metachromatic substances, presumptively mucopolysaccharides, are confined to the matrix of the connective tissue stroma and to the granules of mast cells. The Feulgen reaction for desoxyribonucleoproteins occurs only in the nuclei of the mammary gland.

Glycogen is absent in the mammary gland. Various argyrophilic inclusions occur in the alveolar cytoplasm. The Berlin and Turnbull blue methods for iron yield negative results. Alkaline phosphatase occurs plentifully in the basket cells surrounding the mammary epithelium and in the capillary endothelium during pregnancy and lactation. Moderate reactions occur in the epithelium of non-pregnant rats, guinea pigs and women, but phosphatase declines there during pregnancy and lactation. Stronger concentrations of alkaline phosphatase occur in the cat than in other species. Slight amounts of acid phosphatase occur in nuclei, alveolar contents, colostrum corpuscles and mast cells from the breast.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

I. KANE, G. J., & LOWNDES, K. M. (1947.) **The meat canning industry. Part I—Introductory.**—*Irish vet. J.* **1.** 83–84. **1522**

II. KANE, G. J., & LOWNDES, K. M. (1947.) **The meat canning industry. II. Laboratory control.**—*Ibid.* **1.** 121–126. **1523**

I. The Meat Canning Industry in Eire now consumes some 100,000 head of cattle annually and exports amount to the value of £2,000,000. A strict system of inspection and control is exercised by veterinary and lay inspectors of the Ministry of Agriculture to maintain its high standard of hygiene, production and quality. A central Control Laboratory in the Pathology Department of the Veterinary College checks the purity of samples and carries out research into spoilage. Palatability and appearance are also checked.

II. Bacterial contamination is estimated by direct smears from some of the contents. It is higher in meat that has been immersed in pickle overnight than in meat packed directly after boning. As, however, the meat will, to some extent, sterilize itself, a low count may justify passing the sample. In cases of doubt, the sample is incubated at 55°C. to ascertain if thermophilic organisms are present. The vacuum of the cans is tested by placing them in a chamber from which air is exhausted until the pressure outside the can is less than that inside, when the can will assume the "bulged" condition with an audible "pop". Seams are examined by eye.

—R. MACGREGOR.

LEUTHOLD, A. (1946.) Bericht über den Geschäftsgang des Schweizerischen Zentralkomitees für tierärztliche Hilfe an Kriegsgeschädigte. [**Report on the activities of the Swiss Central Committee for Veterinary Aid to War-Damaged Countries.**] — *Schweiz. Arch. Tierheilk.* **88.** 57–60. **1524**

7,486 francs were collected during the first six months of the activities of the committee. New and repaired instruments, medicaments and dressing material were also donated.—E. A.

GIESECKE, F. (1944.) Die Chemie im Dienste der Veterinärmedizin. [**Chemistry in the service of veterinary medicine.**]—*Skand. VetTidskr.* **34.** 193–221. [In German: English summary.] **1525**

A contribution of chemistry to the preventive side of veterinary medicine lies in the possibilities it opens up of greater speed and precision of analysis of feeding stuffs and of the soil which is responsible for balanced growth of plant materials. Crude methods of analysis of plant feeding stuffs are quite inadequate to assess quality, *e.g.*, the amide or even crude protein fraction may include a large proportion of nutritionally unimportant nitrate; crude fibre is a very composite fraction;

the iodine value of fats may be of great importance as well as the total fat content of a feeding stuff. The estimation of biologically important substances in feeding stuffs requires intensive study.
—R. MARSHALL.

BRAGA, A. (1944.) Sôbre a padronização de produtos biológicos destinados à medicina veterinària. [**Need for standardization of biological products.**]—*Bol. Inst. Vital Brazil.* No. 26. pp. 3–7. [English summary.] **1526**

This article is a plea for the institution of an international commission for the control and standardization of biological products used in veterinary medicine. In particular, the author wants a Pan-American Commission for this purpose, to overcome the difficulties caused in the western hemisphere by the fact that the various European Standards Institutes are so far away.
—I. W. JENNINGS.

See also absts. **1397** (food poisoning); **1410** (infection from cheese).

LIVESTOCK HYGIENE

LETARD, E. (1944.) L'hygiène de l'habitat des animaux de la ferme. [**Hygiene of farm buildings.**]—*Rev. Path. Comp.* **44.** 67–72. **1527**

The results of an enquiry into the state of the farm buildings in France were published in 1939. For the most part, buildings are dilapidated, and maintained in complete ignorance of the most elementary rules of hygiene. The consequences of this shocking state of affairs are seen in the outbreak and spread of infectious and parasitic diseases amongst all types of animals. There is also grave danger to human life living in proximity to the stock, in some cases literally in the same room.

The great majority of farmers are indifferent to any progressive ideas and they have not the money to effect improvements. The most important questions are how to interest the rural population in the necessary improvements, and how these improvements can be realized.

The following rules for hygienic buildings should be observed—convenient site; good ventilation; artificial and natural lighting; non-fluctuating temperature; enough room for each animal; suitable soil for drainage; facilities for cleaning and disinfection, preferably with water on the spot; strict cleanliness for handling of milk. This last is of paramount importance.

The regions in France where the infant mortality rate is highest are those where farm buildings are most defective. Also, those regions which are richest in agricultural produce for children have an infant mortality rate higher than the average rate in France and very much higher than regions less rich agriculturally.

The problem is technical, economic, and even judicial.—P. S. GORDON.

REPRODUCTION AND REPRODUCTIVE DISORDERS

ANDERSON, J. (1947.) **Some factors affecting the pH change in bull semen.**—*J. agric. Sci.* **37.** 11–16. **1528**

A. found previously that the change of pH in seminal fluid is correlated with the initial pH and the initial motility of spermatozoa. In order to exclude the effects of the seminal fluid, which varies in its characteristics, he investigated the change in pH in spermatozoa suspended in fluids of different composition. This change is affected by the buffer capacity, the pH and the glucose content. The results are discussed and it is concluded that there is no practical object in determining the change in pH by incubation in an artificial fluid of uniform and constant composition, instead of in semen.—J. M. ROBSON.

FRADINHO, R. (1946.) O "Soro Global". Nota prévia. [**Pregnancy serum (preliminary note).**] (**A new therapeutic agent.**)—*Rev. Med. vet., Lisboa.* **41.** 276–295. (French summary.) **1529**

This is a general dissertation on the subject of the hormones present in the blood during pregnancy. F. found that serum taken from a five months' pregnant cow, three hours after artificial termination of pregnancy, had galactogenic properties in the cow and bitch. When applied locally it promoted cicatrization of wounds which previously were slow to heal, and it stimulated the implantation and growth of skin grafts.
—I. W. JENNINGS.

ALBERT, A., & MONEY, W. L. (1946.) **The comparative effect of human chorionic and equine gonadotrophins on the rate of ovarian growth.** —*Endocrinology.* **38.** 219–229. **1530**

The effect of pregnant mares' serum gonadotropin and pregnancy urine gonadotropin on the rate of growth of the ovary of the infantile rat was investigated by giving one injection of gonadotropin to 21-day-old rats and at 24-hour intervals, over a period of six days, killing groups of five rats and weighing the ovaries. The ovarian weight reached a maximum after 48 hours, the onset of regression depending on the amount of gonadotropin given. With the larger doses, regression

did not occur until the 72nd to 96th hour. When the results were considered in terms of physiological equivalent amounts (as judged by the amount of gonadotropin required to double ovarian weight on the fifth day when injected subcutaneously to 21-day-old rats once daily for four days), pregnant mares' serum and pregnancy urine gonadotropin had quite different effects on the ovarian growth rate. It is concluded that ovarian growth rate might be employed in qualitative or quantitative determinations on unknown gonadotropins.—ALFRED T. COWIE.

TEUNISSEN, G. H. B. (1946.) Anaphrodisie bij het rund, in het bijzonder betreffende de resultaten van de behandeling met gestyl. **[Anaphrodisia in cattle, with especial reference to its treatment with gestyl.]**—*Tijdschr. Diergeneesk.* **71.** 510–517. [Abst. from English and French summaries.] **1531**

In the years 1941–42, 84 heifers and 52 older cows were treated for anaphrodisia with gestyl [pregnant mare's serum] and pregnyl.

It was not found that gestyl was any more effective therapeutically than pregnyl, even when combined with oestrin.—F. E. W.

PAYNE, M. G., & KINGMAN, H. E. (1947.) **Carotene blood levels and reproductive performance in range Hereford cattle.**—*J. Anim. Sci.* **6.** 50–55. **1532**

Hereford cattle on elevated range pasture in Wyoming were selected for this study. Blood samples were taken as the opportunity served over the period 1943–45. Carotene values were estimated by the method of Madsen and Davis, adapted to the Coleman spectrophotometer, and 125 determinations were made.

A table is provided showing the results for aged cows and heifers; the minimum levels found to be necessary for normal growth and gestation were 117·75 ± 7·21 μg. per 100 ml. for heifers and 82·88 ± 4·11 μg. per 100 ml. for aged cows.
—G. L. BAILEY.

HEUNER, H. (1942.) Hodengrössen bei fruchtbaren und unfruchtbaren Ziegenböcken. **[Testicle sizes of fertile and sterile billy goats.]**—*Inaug. Diss., Hanover.* [Abst. in *Dtsch. tierärztl. Wschr.* **51.** 54. (1943.)] **1533**

Testes measurements were made in fertile male goats aged from three months to eight years. In fertile goats the two testes were of equal size. Three grades of testicular hypoplasia were recognized. In all, measurements were made on 1,233 male goats. H. concluded that it is important in examining male goats to note the size of the testes. The various types of testicular under-development are most readily recognized from the 4th–5th month onward. (See also *V. B.* **15.** 274.)—ALFRED T. COWIE.

DURRELL, W. B. (1947.) **Observations on sterility in dairy cattle and the use of natural and synthetic hormones.**—*Canad. J. comp. Med.* **11.** 290–297. [French summary.] **1534**

D. found that pregnant mare's serum and anterior pituitary-like hormone are indicated in the treatment of delayed conception and cystic ovarian degeneration; bulls affected with impotency improved satisfactorily upon the administration of synthetic androgen. In two cases an acute non-infective mastitis in all quarters of the udder, plus bilateral oophoritis, developed after P.M.S. was used.—THOMAS MOORE.

BERTHELON, M. (1946.) Pathologie de l'ovaire. **[Pathology of the ovary.]**—*Rev. Méd. vét., Lyon et Toulouse.* 97. 357–379. **1535**

A general account dealing from the clinician's viewpoint with the possible causes, the clinical features, and the treatment, of the following pathological conditions of the ovary, in the mare and in the cow:—failure of follicles to develop fully; follicular degeneration before full development; follicular development without the production of oestrus; cysts; infantile ovary. In the mare ovarian atrophy during lactation, stromal sclerosis leading to follicular abnormalities, tumours are dealt with; and in the cow persistent corpus luteum and tuberculosis.
—E. COTCHIN.

LEONARD, S. L. (1947.) **Some fundamentals of endocrine interrelationships.**—*Cornell Vet.* **37.** 78–88. **1536**

This is a review of present knowledge of the inter-relations of the various endocrine glands. It is pointed out that while knowledge of the effect of hormones on laboratory animals is fairly complete little is really known about such matters in the veterinary field, but the knowledge gained in the laboratory can form a rational basis for the use of hormones in the veterinary field.

The conception of the anterior pituitary gland as a master gland is not strictly correct as its relation with the other endocrine organs is a reciprocal one. For instance the anterior pituitary adrenotropic hormone stimulates the adrenal cortex to produce the cortical hormone which acts on the pituitary to inhibit the production of adrenotropic hormone. Similar relations hold with other glands so that administration of hormones as a treatment, may, if continued too long, result in complete depression of the pituitary "tropic" hormone.—ALAN A. WILSON.

LORENZ, F. W., & BACHMAN, G. H. (1947.) **Lipemia and fat deposition in response to oral**

administration of synthetic estrogens.—*Poult. Sci.* **26.** 419–431. **1537**

The effect of oral administration of dianisylhexene and of dienestrol diacetate was observed in promoting fat deposition in cockerels of up to 12 weeks of age. Abdominal adipose fat was found to increase at the same rate as other separated fat depots and was thus used as a convenient measure of fat deposition. Prolonged administration of small doses was more favourable for fat deposition than a more concentrated dosage. The two substances were equally potent weight for weight for fat deposition. Dosages of dienestrol diacetate which will produce lipaemia were separated by a safer margin from those required to produce fat deposition than is the case with dianisylhexene.

—R. MARSHALL.

TRENTIN, J. J., & TURNER, C. W. (1947.) **Effect of adrenalectomy on the mammary gland of the castrated and estrogen treated castrated male rat.**—*Endocrinology.* 41. 127–134. **1538**

In the strain of Wistar rats used, castration results in a reduction but not complete elimination of the alveolar development of the mammary gland normally found in adult males. Adrenalectomy of castrated male rats and maintenance on 1% saline for ten days resulted in a complete elimination of the alveolar development, and thin atrophic ducts. Daily administration of 5 μg. of oestradiol benzoate for ten days caused noticeable duct stimulation, but was relatively ineffective in stimulating alveolar growth in adrenalectomized, castrated rats maintained on salt, as compared to castrated rats.—J. M. ROBSON.

PLAGGE, J. C. (1946.) **Some effects of prolonged massive estrogen treatment on the rat. With special referance to the thymus.**—*Arch. Path.* **42.** 598–606. [Author's summary copied *verbatim.*] **1539**

Extensive epithelial cords and cysts, containing fluid, have been produced in the thymus of the rat after prolonged massive treatment with estradiol dipropionate. Tumors failed to develop even after ten and a half months of continuous injections. Further treatment had to be abandoned because of the development of pyometra, infections of the respiratory tract and other complications leading to death. Cystic structures were most pronounced at the ends of the thymus, particularly at the cranial extremity.

Small epithelial structures, similar to the larger ones of the test animals, were found in the majority of the controls.

Body weight, hair growth and the estrus cycle were also modified by the prolonged and excessive treatment with estrogen.

See also abst. **1471** (vitamin requirements of sows for reproduction).

FOLLEY, S. J., & GREENBAUM, A. L. (1947.) **Changes in the arginase and alkaline phosphatase contents of the mammary gland and liver of the rat during pregnancy, lactation and mammary involution.**—*Biochem. J.* **41.** 261–269. **1540**

Studies were made of changes in mammary gland and liver arginase, and of mammary gland and kidney alkaline phosphatase in pregnancy, lactation and mammary involution in the rat. A method of correcting for the retained milk in the mammary gland tissue was worked out, so that all results were more truly referable to the true moist tissue basis.

There was little difference in the arginase content of the liver during pregnancy and after weaning compared with that of unmated controls, except at the 15th day of pregnancy when lower values were observed. Over the whole lactation period there was a significant increase in liver arginase values. The mammary gland arginase increased slowly during pregnancy and early lactation, and rapidly between the 5th and 10th days of lactation, reaching a maximum at the 20th day, and falling again rapidly to early pregnancy levels after weaning. The alkaline phosphatase content of bony tissue remained relatively constant throughout pregnancy, lactation and mammary involution, but that of the mammary gland increased rapidly during pregnancy, reaching a maximum at parturition and throughout lactation and falling after weaning.

These results suggest that mammary gland arginase is concerned with the deamination of amino acids by the gland and that the increased arginase content during late lactation (in the rat) is due to increased requirements of deaminized residues for the synthesis of milk constituents. It is further suggested that the alkaline phosphatase of the mammary gland may be concerned with the synthesis of nucleoproteins during the growth phase and possibly with the synthesis of casein during lactation.—A. EDEN.

ZOOTECHNY

BLUNN, C. T., & BAKER, M. L. (1947.) **The relation between average daily gain and some carcass measurements.**—*J. Anim. Sci.* **6.** 424–431. **1541**

A study was made of the influence of inherited factors on carcass measurement on 416 animals of a partially inbred line of Duroc-Jersey pigs. The data collected were statsitically analysed and

the results are tabulated. Inheritable factors accounted for only 12% of the variance for depth of back fat, but 23% of that for length of hind leg. Environmental factors accounted for the remainder.—G. L. BAILEY.

VON AXELSSON, J. (1943.) Das Intensitätsproblem bei der animalischen Produktion. **[The problem of intensive methods in animal production.]**—*Lantbr.-högskol. Ann. Uppsala.* **11.** 51–70. [In German.] **1542**

The author recommends the evolution of new feeding standards for each species. A set of figures used in Germany is compared with feeding standards in use in England.—A. G. WARREN.

TECHNIQUE AND APPARATUS

SPRATT, N. T., Jr. (1947.) **A simple method for explanting and cultivating early chick embryos** *in vitro*.—*Science.* **106.** 452. **1543**

S. describes a simple method, which he has found suitable for class use, of cultivating early chick-embryos *in vitro*. The essential apparatus includes only items of general laboratory equipment and, by employing a medium containing egg-albumen, sterilization is rendered unnecessary. Provided that a reasonable standard of cleanliness is observed, the bacteriolytic action of the egg-albumen is stated to be sufficient to prevent contamination.

The medium is prepared in two parts. The first consists of the white of one unincubated egg diluted with 50 ml. of chick-Ringer solution. The second is prepared by heating 0·13–0·15 g. agar in 30 ml. of Ringer solution. When the Ringer-agar has cooled to 40–45°C., 20 ml. of the Ringer-albumen solution are added and, after mixing, about 2 ml. are placed in each of a number of watch glasses which rest on moist cotton-wool rings in Petri dishes. After the medium has cooled, a trimmed blastoderm in Ringer solution is transferred by a wide-mouthed pipette to the surface of the agar-gel. The embryo is oriented as desired, excess Ringer solution is removed with a fine pipette, the cover of the Petri dish is replaced and the dish is incubated. A simple incubator, made from a desk-lamp and a cardboard box, may be used.—J. RICHARD HUDSON.

RODRIGUEZ, F. M. (1942.) El diagnóstico de la durina por la fijación del complemento. **[Complement fixation test in the diagnosis of dourine.]**—*Trab. Inst. Biol. anim., Madrid.* **7.** 319–325. **1544**

A description is given of the preparation of antigen for the dourine complement fixation test by the method of WATSON, and by that of ZOTTNER. It is stated that Watson's antigen retains its antigenic value for a variable time, but that after the 14th day its activity begins to decline, and after 25 days complement is only fixed weakly, whilst according to GHEORGHE, Zottner's antigen retains its strength for a year. In spite of its disadvantages Watson's antigen has been used at the Madrid Institute of Animal Biology, but it has been found more economical to use g. pigs as the source of trypanosomes instead of rats. Details are given of the use of this new type of antigen.

It is concluded that fresh antigen should be prepared at fortnightly intervals, and that equine sera under test should be inactivated for half an hour at 60°C., and donkey sera at 64°C.—U. F. R.

FERJANČIĆ, M. (1944.) Kretanje klorida u krvi kod grudne zaraze konja. **[Chloride content of the blood in equine infectious bronchitis.]**—*Vet. Arhiv.* **14.** 75–90. [Abst. from German summary.] **1545**

Employing the semi-microtechnique, the normal chlorine level was determined in the blood of 100 healthy horses, and also the possible error. Application of the technique to affected horses gave the following results: In horses with infectious bronchitis there is a transference of blood chlorine into the tissues and into the inflamed lung tissue which results in a fall in blood chlorine level until shortly before the crisis. After the crisis, the Cl level again rises to normal. The Cl determination is a useful diagnostic aid. Intravenous injection of 4·5 g. neosalvarsan caused a rise in Cl level in the blood of both healthy and affected horses; possible causes for this are suggested.

—K. J. SINCLAIR.

SABOVLJEV, A. (1940.) Primenjivost staklenih elektroda za pH merenja u fiziološkim ispitivanjima. **[Use of the glass electrode in physiological research.]**—*Vet. Arhiv.* **10.** 469–477. [Abst. from German summary.] **1546**

A glass electrode made of special Shoot glass was compared with the hydrogen (valve and U) and the quinhydrone electrodes, and found to give consistent readings in agreement with those of the standards.

Comparative pH determination in blood samples from dogs and human beings with the above three types of apparatus showed that the highest values were obtained with the valve and the lowest with the U electrodes. The pH values by glass and quinhydrone electrodes were intermediate. The results indicate that the glass electrode is the most suitable for pH determination in blood, being unaffected by blood CO_2.

—K. J. SINCLAIR.

BOOK REVIEWS

PATERSON, J. D. [M.R.C.V.S. Of the Agricultural College, Wye, Kent, in the University of London]. (1947.) **Good and healthy animals.** pp. xi + 240. London: English Universities Press. 4s. 6d. **1547**

This book is written for farmers and deals with the diseases of livestock in Gt. Britain. The anatomy and physiology of the main body systems are described in non-technical language. This section is brief but is adequate to give the reader a general understanding of the normal processes and to recognise disturbances due to disease. The more important contagious, parasitic and other diseases are described with special reference to causation and prevention; no attempt is made to go into detailed instructions for treatment.—M. C.

HALL, M., Edited by. (1948.) **Five hundred varieties of herbage and fodder plants.** pp. viii + 328. Aberystwyth: Commonwealth Bureau of Pastures and Field Crops. **1548**

This book contains data concerning a great number of varieties of plants used as animal fodder. It consists of an introduction, pp. v–viii, and two main parts. Part I, pp. 1–295, contains information received from official correspondents in Great Britain, the Dominions and some European countries. For each variety information is given regarding origin, characteristics, adaptation to climate, resistance to disease, uses, whether obtainable on the open market and whether grades are officially certified by any authority. Part II, pp. 297–316, contains an index of references to varieties in *Herbage Abstracts*, Vols. 1–17. Those interested in the introduction and trial of exotic varieties will find this book of great value.

RICHARDSON, U. F. [B.Sc., M.R.C.V.S.]. (1948.) **Veterinary protozoology.** pp. viii + 240. Illustrated. Edinburgh & London: Oliver & Boyd. 18s. **1549**

A textbook of veterinary protozoology in English was badly needed and this small book will be welcomed.

It consists of twelve chapters, first an introductory chapter of a general nature, then three dealing with the Sporozoa; four covering the Mastigophora; the Rhizopoda and the Ciliata are dealt with in one combined chapter and unclassified organisms, chemotherapy and technique have one chapter each. The arrangement is designed to meet the needs of the veterinarian rather than that of the systematic protozoologist.

In a small book of 240 pages compression has been necessary and this has been achieved without much loss of accuracy although in places there is a tendency to oversimplification. We have here an excellent groundwork for a larger book and it is hoped that the author will be able to expand on it in a further edition.

The section on bovine trichomoniasis is somewhat uneven; for example the importance of artificial insemination in control and eradication is not sufficiently stressed and while the intradermal test is described in some detail there is no mention of the agglutination test nor of the presence of agglutinins in vaginal mucus. Incidentally the date of Riedmuller's description of *Trichomonas foetus* is 1928 and not 1929 as given in the text.

In the description of the life cycle of the Plasmodiidae although the exo-erythrocytic stages occurring in the reticulo-endothelial system are described there is no mention of the pre-erythrocytic or cryptozoic stages of Huff, C. G., & Coulson, F. (1944) which bridge the gap between inoculation of the sporozoites by the mosquito and the first appearance of the parasites in the erythrocytes.

The bibliography given, sometimes at the end of a section and sometimes at the end of a chapter, is insufficient and the references in the text are not always easy to verify. In the selection of references for inclusion in the bibliography some important papers have been omitted, for example in the references to the Plasmodiidae, Sheather's work on *P. bubalis* of the buffalo; and in the section on bovine trichomoniasis the references to Kerr's work do not include his more important papers and there are no references to the papers by Kerr & Robertson. This part of the book could be greatly extended with advantage.

A few spelling errors are mentioned in order that they may be corrected in future editions, for example, "hyallomma" for hyalomma on p. 86, "phenzl" for phenyl on p. 208 and "periplasmosis" for piroplasmosis on p. 200.

In the short but up-to-date section on chemotherapy a few errors have occurred in the manner in which the structural formulae of some of the compounds have been set out.

Criticism of detail is easy especially in a book where considerations of space have made compression so necessary but the merits of the book far outweigh these small defects and the author has rendered a great service to students, teachers and especially to all veterinarians who work in tropical and subtropical countries.

5445—Wt.P7—Dd.284—9/48—H.R.G., Ltd.—G.13.

Printed under the authority of His Majesty's Stationery Office by H. R. GRUBB, LTD., Croydon

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications indexed for this purpose was included in *Index Veterinarius*, Vol. 6, No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin*, Vol. 9, No. 1.

About 10,000 references are indexed each year, each reference being suitably cross-indexed alphabetically under subjects and under names of authors.

As each half-yearly issue consists of a single complete alphabetical index of subjects and authors' names, a search through it involves a minimum of trouble, and all information required is readily found.

Each number contains the indexing done by the Bureau during the previous half-year, *i.e.*, No. 1, issued in December, covers the indexing done during the previous January to June.

The dates of issue of the two numbers of each volume are as follows:—

No. 1.—Issued December. Indexing period previous January—June.
No. 2.—Issued June. Indexing period previous July—December.

Vols. 1 to 3 (1933, 1934 and 1935) of the Index were produced on a duplicator; from Vol. 4 onwards it has been printed. Vols. 1 to 5 were issued in quarterly parts; the issue is now half-yearly. Annual Subscription, £5.

A limited number of copies printed on one side only are available for those who wish to mount references on cards.

Orders may be sent to: Central Sales Branch (Commonwealth Agricultural Bureaux), Agricultural Research Buildings, Penglais, Aberystwyth, Wales.

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

INDIAN JOURNAL OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY

Quarterly

Journal devoted to the publication of scientific research relating to the health, nutrition and breeding of livestock.

Annual subscription Rs.6; per part, Rs.2.

INDIAN JOURNAL OF AGRICULTURAL SCIENCE

Bimonthly

Journal of agriculture and the allied sciences, mainly devoted to the publication of the results of original research and field experiments.

Annual subscription Rs.15; per part Rs.3.

INDIAN FARMING

Monthly Magazine for the Layman

Features of the magazine include *original articles* of practical interest to farmers, *What the scientists are doing, What's doing in all India, What would you like to know?* etc., of special interest to farmers, landowners, rural development workers, co-operative societies, government officials, clubs, libraries and college students.

Annual subscription Rs. 6; single copy As./8/-.

Manager of Publications, Civil Lines, Delhi

COMMONWEALTH AGRICULTURAL BUREAUX

JOURNALS PUBLISHED BY BUREAUX ON RELATED SUBJECTS

	Published by the:—
Dairy Science Abstracts	Commonwealth Bureau of Dairy Science, Shinfield.
Animal Breeding Abstracts ...	Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh.
Herbage Abstracts	Commonwealth Bureau of Pastures and Field Crops, Aberystwyth.
Nutrition Abstracts and Reviews	Commonwealth Bureau of Animal Nutrition, Aberdeen.

Annual subscription to the first three is 25s. (with a special reduction of 20 per cent. for orders received direct from subscribers in Great Britain, the Dominions and Colonies); the annual subscription to Nutrition Abstracts and Reviews is 42s.

RECENT OCCASIONAL PUBLICATIONS ON AGRICULTURE AND FORESTRY

BUREAUX JOINT PUBLICATIONS

No.		Price
9.	The use of aerial survey in forestry and agriculture. Commonwealth Bureaux of Forestry and Pastures and Field Crops, 1946 ...	7s. 6d.
10.	The use and misuse of shrubs and trees as fodder. Bureaux of Pastures and Field Crops, Forestry, and Animal Nutrition, 1946	9s. 0d.
11.	Some British books on agriculture, forestry and related sciences, 1939–45. July, 1946	3s. 0d.
12.	Phenothiazine, a review and bibliography	4s. 0d.

TECHNICAL COMMUNICATIONS, ETC.

	Commonwealth Bureau of Animal Health, Weybridge.	
	Review Series No. 2. Modes of spread of *Streptococcus agalactiae* infection in dairy herds. A report on co-ordinated observations by the Agricultural Research Council of the United Kingdom. May, 1944	3s. 0d.
	Commonwealth Bureau of Animal Nutrition, Aberdeen.	
15.	Minerals in pasture. Deficiencies and excesses in relation to animal health. By F. C. Russell. May, 1944	5s. 0d.
16.	Diet in relation to reproduction and the viability of the young. Part 1. Rats and other laboratory animals. August, 1946	3s. 0d.
	Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh.	
	The semen of animals and its use for artificial insemination. By James Anderson. Spring, 1945	7s. 6d.
	Commonwealth Bureau of Pastures and Field Crops, Aberystwyth.	
36.	The grasslands of Latin America. By Miss G. M. Roseveare. Late 1946 ...	7s. 6d.
38.	Advances in grassland husbandry and fodder production. Second symposium. Late 1946...	6s. 0d.
	Commonwealth Bureau of Plant Breeding and Genetics, Cambridge.	
	The new genetics in the Soviet Union. By P. S. Hudson and R. H. Richens. May, 1946	6s. 0d.
	Commonwealth Bureau of Soil Science, Harpenden.	
43.	Land classification for land-use planning. June, 1946	4s. 0d.
	Commonwealth Mycological Institute, Kew.	
	An annotated bibliography of medical mycology, 1945. 1946	5s. 0d.

Subscriptions

All correspondence regarding subscriptions to journals and sales of occasional publications should be addressed to, and cheques made payable to:—Central Sales Branch (Commonwealth Agricultural Bureaux), Penglais, Aberystwyth, Wales.

Printed in Great Britain by H. R. Grubb, Ltd., Croydon.